Rose & Westra
A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

The Widdicomb Building
601 Fifth Street NW
Suite 102
Grand Rapids, MI 49504
T: 616.956.6123
F: 616.288.3327
www.rosewestra.com
www.gza.com

# GROUNDWATER-SURFACE WATER INTERFACE (GSI) RESPONSE ACTIVITY PLAN

## North Kent Study Area

September 23, 2020
File No. 16.0062961.50

**PREPARED FOR:**
Wolverine World Wide, Inc.
Rockford, Michigan

**Rose & Westra, a Division of GZA GeoEnvironmental, Inc.**
601 Fifth Street NW | Suite 102 | Grand Rapids, MI 49504
616.956.6123

30 Offices Nationwide
www.gza.com

Copyright© 2020 GZA GeoEnvironmental, Inc.

**TABLE OF CONTENTS**

**1.0 INTRODUCTION ..... 1**
**2.0 CONCEPTUAL SITE MODEL ..... 1**
2.01 HOUSE STREET DISPOSAL SITE ..... 2
2.02 WOLVEN AND JEWELL AREAS ..... 2
2.03 TOPOGRAPHY ..... 2
2.04 REGIONAL HYDROLOGY ..... 3
2.05 REGIONAL GEOLOGY ..... 3
2.06 REGIONAL HYDROGEOLOGY ..... 4
2.07 GROUNDWATER INVESTIGATIONS ..... 4
2.08 GROUNDWATER SAMPLING ..... 5
2.09 SITE GEOLOGY ..... 5
2.10 GROUNDWATER FLOW ..... 7
2.11 PFAS DISTRIBUTION IN GROUNDWATER ..... 8
2.12 GSI AND APPLICABLE RULE 57 WATER QUALITY STANDARDS ..... 8
2.13 DATA GAPS ..... 9
**3.0 PROPOSED STATEMENT OF WORK ..... 9**
3.01 HSDS STUDY AREA ..... 10
3.02 WOLVEN/JEWELL STUDY AREA ..... 10
**4.0 INVESTIGATION METHODOLOGY ..... 11**
4.01 PIEZOMETERS INSTALLATION AND SAMPLING ..... 11
4.02 PORE WATER SAMPLING ..... 11
**5.0 SAMPLING AND ANALYTICAL PROCEDURES ..... 12**
5.01 SAMPLING LOCATIONS ..... 12
5.02 SAMPLE COLLECTION AND LABELING ..... 12
5.03 SAMPLE SHIPPING ..... 13
5.04 ANALYTICAL METHOD AND PARAMETERS ..... 13
**6.0 DATA QUALITY ASSURANCE AND CONTROL ..... 13**
**7.0 INVESTIGATION DERIVED WASTE ..... 13**
**8.0 ANTICIPATED SCHEDULE ..... 14**
**9.0 REFERENCES ..... 14**

**TABLES**

TABLE 1 EXISTING MONITORING WELL CONSTRUCTION INFORMATION
TABLE 2 STATIC WATER LEVEL MEASUREMENTS
TABLE 3 GROUNDWATER ANALYTICAL DATA – PFAS, HOUSE STREET DISPOSAL SITE STUDY AREA
TABLE 4 GROUNDWATER ANALYTICAL DATA – PFAS, WOLVEN/JEWELL STUDY AREAS

**APPENDED FIGURES**

FIGURE 1 TOPOGRAPHIC MAP – NORTH KENT STUDY AREA
FIGURE 2 EXISTING MONITORING WELL LOCATION PLAN
FIGURE 3 RESIDENTIAL DRINKING WATER WELLS, GEOLOGICAL CROSS-SECTIONS
FIGURE 4 GEOLOGICAL CROSS-SECTION A-A’
FIGURE 5 GEOLOGICAL CROSS-SECTION B-B’
FIGURE 6 GEOLOGICAL CROSS-SECTION C-C’
FIGURE 7 GEOLOGICAL CROSS-SECTION D-D’
FIGURE 8 GEOLOGICAL CROSS-SECTION E-E’
FIGURE 9 GEOLOGICAL CROSS-SECTION F-F’
FIGURE 10 GEOLOGICAL CROSS-SECTION G-G’
FIGURE 11 GEOLOGICAL CROSS-SECTION H-H’
FIGURE 12 GEOLOGICAL CROSS-SECTION I-I’
FIGURE 13 GROUNDWATER ELEVATION CONTOURS, SHALLOW ZONE, NOVEMBER 2019
FIGURE 14 GROUNDWATER ELEVATION CONTOURS, DEEP ZONE, NOVEMBER 2019
FIGURE 15 PFOS ISOCONCENTRATION MAP
FIGURE 16 PFOA ISOCONCENTRATION MAP
FIGURE 17 TOTAL PFAS ISOCONCENTRATION MAP
FIGURE 18 PROPOSED GSI AND PORE WATER SAMPLING LOCATIONS
FIGURE 18A PROPOSED GSI AND PORE WATER SAMPLING LOCATIONS WOLVEN NORTHWEST AREA
FIGURE 18B PROPOSED GSI AND PORE WATER SAMPLING LOCATIONS AREA 19 AND WOLVEN NORTHEAST
FIGURE 18C PROPOSED GSI AND PORE WATER SAMPLING LOCATIONS AREAS 11 AND 12

**APPENDICES**

APPENDIX A GROUNDWATER MONITORING WELL INSTALLATION LOGS, SOIL BORING LOGS
APPENDIX B STANDARD OPERATING PROCEDURES

**ACRONYMS**

| | |
|---|---|
| CD | Consent Decree |
| CFS | Cubic Feet per Second |
| CSM | Conceptual Site Model |
| DoD | United States Department of Defense |
| EGLE | Michigan Department of Environmental, Great Lakes and Energy |
| FAV | Final Acute Values |
| FCV | Final Chronic Values |
| GIS | Geographic Information Systems |
| GSI | Groundwater-Surface Water Interface |
| HNDV | Human Health Non-Drinking Water Values |
| HSDS | House Street Disposal Site |
| ID | Identification |
| MDEQ | Michigan Department of Environmental Quality |
| MDOT | Michigan Department of Transportation |
| MGDL | Michigan GIS Data Library |
| ml/min | Milliliters per Minute |
| MS/MSD | Matrix Spike/Matrix Spike Duplicate |
| NE | Northeast |
| ng/L | Nanogram per Liter |
| NKSA | North Kent Study Area |
| ORP | Oxidation-Reduction Potential |
| PDF | Portable Document Format |
| PFAS | Per- and Polyfluoroalkyl Substances |
| PFBS | Perfluorobutane Sulfonic Acid |
| PFHxA | Perfluorohexanoic Acid |
| PFHxS | Perfluorohexane Sulfonic Acid |
| PFNA | Perfluorononanoic Acid |
| PFOA | Perfluorooctanoic Acid |
| PFOS | Perfluorooctane Sulfonate |
| PVC | Polyvinyl Chloride |
| QAPP | Quality Assurance Project Plan [*Former Wolverine Tannery, House Street Disposal Area, and Wolven/Jewell Area, Per- and Polyfluoroalkyl Substances Investigation Program]* |
| QA/QC | Quality Assurance/Quality Control |
| QSM | Quality Systems Manual |
| R&W/GZA | Rose & Westra, a Division of GZA GeoEnvironmental, Inc. |
| RAP | Response Activity Plan |
| SAP | Sampling and Analysis Plan |
| SOP | Standard Operating Procedures |
| USGS | United States Geological Survey |
| VAP | Vertical Aquifer Profiling |
| Wolverine | Wolverine World Wide, Inc, |
| WV | Wildlife Values |

## 1.0 INTRODUCTION

On behalf of Wolverine, R&W/GZA, prepared this RAP for the proposed GSI investigation in the NKSA. The objective of this RAP is to investigate potential environmental risks to the GSI in the Rogue River, due to regulated PFAS in groundwater, originating from the former HSDS and the Wolven/Jewell area. Based on the flow and PFAS distribution assessment, the following locations are identified as potential surface water discharge areas for the PFAS-containing groundwater in the HSDS and Wolven-Jewell study areas:

- Southeast downgradient of the HSDS primary plume;
- Downgradient of the HSDS, near the confluence of the Rogue River and the Grand River;
- Downgradient of the HSDS, near the Freska Lake area;
- Wolven Northeast study area;
- Wolven Northwest study area; and
- North Childsdale study area, downgradient of the Wolven study area.

This RAP is prepared pursuant to CD No. 1:18-cv-00039-JTN-SJB, effective February 19, 2020. Specifically, this scope of work is established in Sections 7.4, 7.10, and Appendix S of the CD. This RAP is organized into the following sections:

- Introduction
- CSM
- Proposed Statement of Work
- Investigation Methodologies
- Sampling and Analysis Methods and Procedures
- Data Quality Objectives
- Data Quality Control and Assurance
- Project Schedule for Field Sampling and Analysis
- Project Schedule for Data Evaluation and Report Submittals

The information obtained during the implementation of this RAP will be used as provided in Section 7.10(e) of the CD.

## 2.0 CONCEPTUAL SITE MODEL

The development of the CSM (as defined in Section 4.4 of the CD) was based on interpretation of regional geology and hydrogeology, residential water well sampling data in the NKSA, and groundwater investigations performed associated with the former HSDS and Wolven/Jewell areas. **Figure 1** is a layout of the NKSA and the PFAS Investigation Areas. For the purpose of this RAP, the CSM is focused on the groundwater flow from the source areas to the Rogue River, PFAS distribution in groundwater, and the fate and transport of PFAS in groundwater.

The following sections provide discussions of source areas, hydrology, geology and hydrogeology, PFAS distribution in groundwater, groundwater flow, and PFAS transport.

## 2.01 HOUSE STREET DISPOSAL SITE

The HSDS, located at 1855 House Street NE, Plainfield Township, Kent County, Michigan, encompasses approximately 76 acres (**Figure 1**). The HSDS is currently undeveloped and, according to available information, no buildings were previously present. An electric utility right-of-way and associated high-voltage transmission lines cross the northern portion of the HSDS, and an access road from House Street runs south to north across the HSDS.

The properties surrounding the HSDS are primarily undeveloped or residential. Properties to the northwest are undeveloped extending to Clear Bottom Lake and Freska Lake. Properties to the west, southwest, and northeast are primarily residential. House Street NE abuts the HSDS to the south and southeast. Portions of the eastern HSDS boundary are formed by Herrington Avenue NE. Land owned by MDOT is present south and southeast of the HSDS (US-131 right-of-way), and additional residential properties are located westward along House Street.

The HSDS was a State of Michigan licensed and regulated disposal facility from the mid-1960s through 1978. Until 1970, the HSDS received leather tanning byproducts over a portion of time. EGLE Remediation and Redevelopment Division files indicated that HSDS's waste disposal license expired in 1978, but it appears no waste was disposed after 1970. It has been determined that the byproducts contained PFOS and PFOA and their precursors, which are part of a larger group of PFAS. PFAS were in Scotchgard™, a waterproofing material manufactured by 3M Company, that was applied to some leather goods manufactured at the former Wolverine Tannery site in Rockford, Michigan. Based on past investigation data at Wolverine's Tannery Site (R&W/GZA, 2019), the byproducts also contained other substances. However, the data indicates that only PFOS and PFOA appear to be migrating to the GSI areas of interest.

Prior to Wolverine acquiring the HSDS in 1964 and Michigan's first disposal area licensing statute (PA 87 of 1965), Wolverine and other entities disposed of materials on the HSDS (perhaps as early as the 1940s) and also possibly on nearby real estate currently identified as the south adjoining MDOT property and nearby Imperial Pine parcel.

## 2.02 WOLVEN AND JEWELL AREAS

Certain PFAS were detected in wells in the Wellington Ridge neighborhood, located between 10 and 11 Mile Roads, west of Wolven Avenue, and east of US-131. In addition, certain PFAS were also detected in the groundwater monitoring wells near the North Kent Landfill area. No evidence of waste materials was detected during investigations conducted to date in this area. Historical aerial photographs suggest a portion of a gravel pit was previously located in the area of the Lady Lauren cul-de-sac of the Wellington Ridge Development. Aerial photographs suggest disturbances in the gravel pit area ceased by 1965. **Figure 1** identifies the locations of the Wolven/Jewell Areas and the North Kent Landfill Area.

## 2.03 TOPOGRAPHY

As shown in **Figure 1**, the terrain is generally hilly in the region. The ground surface elevation at HSDS ranges from 740 to 800 feet. The HSDS is flanked by higher ground to the northeast and southwest, but ground surface generally dips to the northwest toward the Clear Bottom Lake and Freska Lake, and to the southeast toward the Rogue River. Ground surface elevations for the area east of the HSDS range from 800 to more than 900 feet; ground surface elevations for the west to southwest of the HSDS range from 800 to 820 feet, with lower terrains to the northwest and southeast.

Ground surface elevations in the eastern portion of the Wolven/Jewell study area, where the Wellington Ridge neighborhood is located, range from approximately 780 to more than 930 feet. Most of the neighborhoods in the eastern portion of the Wolven/Jewell study area sit on relatively high ground, and the lowland areas are generally between the hills, acting as surface water drainage pathways. Ground surface generally dips in various directions, to the west and northwest areas of the Wolven/Jewell study area, and northeast toward Wolven Northeast, toward the Rogue River. The portion of the Wolven/Jewell study area located west of US-131 has ground surface elevations ranging from approximately 710 to 850 feet. The Wolven northeast study area has ground surface elevations ranging from approximately 720 to 910 feet.

## 2.04 REGIONAL HYDROLOGY

The regional hydrology, geology (Section 2.05) and hydrogeology (Section 2.06) are used to assist in determination of groundwater conditions within the NKSA and specifically as it interacts with the Rogue River for this GSI evaluation.

The NKSA is situated within the Rogue River Basin (Basin No. 14F), which is part of the Lower Grand River watershed (HUC 0405006). Based on the Michigan's Major Watersheds – Sub-basins GIS data (Michigan Department of Environmental Quality, 2011) downloaded from MGDL, the HSDS and Wolven/Jewell study areas are situated within the Rogue River Basin (Basin No. 14F), which is part of the Lower Grand River watershed (HUC 0405006). The Rogue River Basin consists of 12 sub-basins, four of which are near the Site area. The HSDS is situated on the water divide of two sub-basins: HUC 405006040080 and HUC 405006040120; the Wolven/Jewell study areas are situated in sub-basins HUC 405006040080 and HUC 405006040110. All of these three sub-basins drain to the Rogue River, which discharges to the Grand River. The HSDA is also near sub-basin HUC 45006050050, which is part of the Grand River basin.

The 2016 National Oceanic and Atmospheric Administration climate data report[1] for Grand Rapids, Michigan, indicates that the mean annual precipitation for the 80-year record period is approximately 36 inches. Based on the state-wide GIS data for the estimated annual groundwater recharge (Michigan State University, 2005)**,** the estimated precipitation at the NKSA ranged from 9 to 15 inches.

From 1989 to 2016, the average annual streamflow rate at USGS Gaging Station No. 04118500 in Rockford, Michigan, is approximately 260 CFS, and the average baseflow rate approximately 210 CFS. The gaging station measures the flow for the sub-basin, HUC 405006040110, and all the upstream sub-basins, representing a drainage area of approximately 234 square miles, according to the USGS record.

## 2.05 REGIONAL GEOLOGY

Overburden in Kent County is a thick sequence of Pleistocene glacial deposits. The thickness of glacial deposits ranges from 11 to 800 feet in Kent County; however, the majority of glacial deposits range from 200 to 400 feet in thickness (Western Michigan University, 1981; Farrand, 1982). The glacial deposits in the county include till, outwash and lacustrine deposits. Till occurs in end and ground moraines (till plains), interspersed on the surface throughout the County (Stramel, Wisler, & Laird, 1954). For the area near the City of Rockford and Plainfield Township, the Michigan Glacial Land Systems (Michigan State University, 2015) indicates that proglacial outwash plain is present along the Rogue River, and end moraines are present on either side of the Rogue River extending to the "wide" near the Grand River. At the Site and its vicinity, end moraines of medium-textured till are present. The ground (till plain) and end moraine belong to the unstratified group of deposits, composed of fine- to coarse-grained material, including silt, sand, gravel and boulders.

[1] https://www.ncdc.noaa.gov/cdo-web/search

Based upon bedrock maps for the area (MDEQ, 1987), the bedrock beneath the NKSA includes the Michigan basin series. Based on GIS data from EGLE (MDEQ, 1987), Jurassic "red beds" are present in most of the site area and its vicinity, with small areas of Saginaw formation outcrops. The Jurassic "red beds" are often poorly consolidated or unconsolidated and consist primarily of clay, mudstone, siltstone, sandstone, shale and gypsum. The "red beds" are of low permeability and are considered a confining unit. However, locally in the county, the "red beds" have been documented to supply small quantities of water (Apple & Reeves, 2007). Beneath the "red beds," bedrock in the region consists of the Mississippian-aged sandstone (Marshall formation), shale (Michigan formation), and the Bayport limestone as well as the Pennsylvanian-aged Saginaw formation. The regional dip is northeasterly toward the center of the Michigan basin.

Based on the Hydrogeologic Atlas of Michigan (Western Michigan University, 1981), the top of bedrock elevation ranges from 500 to 550 feet near the City of Rockford. The top of bedrock elevations at the HSDS area were estimated to range from 540 to 580 feet (R&W/GZA, 2018).

## 2.06 REGIONAL HYDROGEOLOGY

The direction of regional groundwater flow is influenced by the primary surface water features of the Rogue River and the Grand River. Streamflow data from the USGS Gaging Station indicates that the Rogue River is gaining stream, acting as a groundwater discharge zone. Based on the static groundwater level in the Wellogic - Statewide Wells GIS Data for Kent County (Michigan State University, 2005a through 2005d), regional groundwater contours were interpolated by R&W/GZA. The regional groundwater contours also indicate regional groundwater flow pattern generally follows the topography, discharging to the Rogue River and the Grand River.

## 2.07 GROUNDWATER INVESTIGATIONS

R&W/GZA retained drilling contractors to perform subsurface exploration and monitoring well installation to continue delineation of the extent of PFOA and PFOS both vertically and laterally in the NKSA. Since 2017, R&W/GZA oversaw the installation of 84 groundwater monitoring wells at 29 locations in the HSDS study area, and 36 groundwater monitoring wells at 16 locations in the Wolven/Jewell study areas. At most of the locations, multi-depth cluster wells were installed. The borings were drilled using either hollow-stem auguring or rotosonic techniques. Soil samples were collected and logged every 5 feet. VAP groundwater samples were collected every 10 feet in the saturated zone and submitted to an independent laboratory for the PFAS analysis using isotope dilution method in accordance with the most recent version of the DoD QSM procedures.

Monitoring well screen intervals were selected based on PFAS VAP sampling results and geological conditions. Each monitoring well was constructed of factory-slotted, 0.010-inch, 5-foot-long PVC screen (in a few cases, 10 feet), and flush-threaded well casing. The annular space surrounding the well screen was filled with sand filter pack to approximately 3 feet above the top of the well screen, followed by a one-to-one and one-half foot-thick hydrated bentonite seal. The remaining annulus was filled with cement and bentonite grout to approximately one foot bgs. The wells were finished with a steel protective casing set in a concrete pad. A locking expansion cap was placed in the top of the PVC casing. **Appendix A** includes the soil boring and well installation logs. See **Table 1** for well completion information and **Table 2** for static water level measurements. See **Figure 2** for the groundwater monitoring well locations.

Following installation, the newly installed wells were developed to remove sediment from the sand-filter pack and well casing. The wells were developed using a 12-volt Mini-Typhoon® submersible pump equipped with dedicated tubing for each well. The pump was decontaminated between wells using a water and Alconox® wash with a water rinse. The wells were developed until the water ran clear. The development water was containerized and staged prior to proper disposal. The tubing and other disposable materials used during the well development were placed in a separate drum and stored for proper disposal.

In addition, surface water level measurement gauges were installed in the following locations in the Rogue River:

- Rockford Dam Seawall;
- East Bridge Street Bridge;
- Rogue River Road Bridge; and
- Jericho Avenue Bridge

The water levels measured from these locations were used in combination with available gaging height data at USGS gaging station, USGS04118500, to evaluate surface water levels in the Rogue River.

## 2.08 GROUNDWATER SAMPLING

Groundwater sampling was conducted quarterly throughout 2018 and 2019 using low-flow purging and sampling procedures. The wells were purged using either a GeoTech Peristaltic Pump or a GeoTech Bladder Pump and control box. Static water levels in the monitoring wells were measured to maintain stabilized drawdowns during purging. Field indicator parameters, temperature, pH, dissolved oxygen, specific conductance, ORP and turbidity, were monitored using a YSI PRO and field turbidity meters in accordance with the low-flow sampling SOP in the project QAPP. Once the field parameters stabilized, a groundwater sample was collected by disconnecting the tubing from the flow-through cell and collecting the sample directly from the tubing.

Groundwater samples were collected in laboratory-supplied sample containers labeled with the well ID, sample time and date, and analytes. The samples were packed in coolers with ice and shipped to the laboratory under chain-of-custody control via overnight express shipping.

Groundwater PFAS analytical data for the HSDS area and the Wolven/Jewell areas are summarized on **Tables 3** and **4**, respectively. As the subsurface exploration and monitoring well installation progressed, the newly installed wells were added to the sampling list in the quarter following their installation and development.

## 2.09 SITE GEOLOGY

This section provides a summary of the geology in the NKSA, based on borehole data collected during the subsurface exploration and groundwater monitoring well installation described in **Section 2.07**, and the residential water well construction information and lithology data downloaded from the online Wellogic System.[2] The Wellogic System made available individual well logs in PDF, GIS shapefiles of county-wide well locations and construction information, and database files of lithology data for some of the wells. R&W/GZA has attempted to verify the well locations by comparing the well addresses to the Kent County Parcel GIS shapefiles and found that some of the well locations in the Wellogic GIS shapefiles are incorrect. To rectify, the Kent County parcel center coordinates are used for the residential well locations if the well addresses are verified with the Kent County Parcel GIS shapefiles. The majority of the well addresses in the Wellogic System GIS shapefiles were verified, and the parcel center locations were used as their coordinates. For some well locations, the addresses of which were not verifiable, the locations in the Wellogic System GIS files were kept and qualified with a note. In addition, lithology data for some of the wells in the Wellogic System GIS shapefiles were not available, and R&W/GZA downloaded the PDF well logs, and compiled the available lithology data into the well lithology database.

The monitoring well locations and the residential water wells with lithology data are shown in **Figure 3.** Geologic cross-sections A-A', B-B', C-C', D-D', and E-E' are created in the HSDS study area, and geologic cross-sections F-F',

[2] https://secure1.state.mi.us/wellogic/Login.aspx?ReturnUrl=%2fwellogic%2fdefault.aspx

G-G', H-H' and I-I' in the Wolven/Jewell study areas to show the lithology in the study areas. See **Figures 4** through **12** for the geological cross-sections.

HSDS Study Area

In the HSDS study area, cross-section A-A' is constructed along the primary plume center line, following the paleo-channel on the Lidar Bare Earth Elevation image on **Figure 3**. Cross-section B-B' is immediately southwest of cross-section A-A'. The lithologies of both A-A' and B-B' are predominantly coarse-grained soil, with the presence of fine-grained soil in a few borings with limited thickness.

Cross-section C-C' is located north-south toward the Grand River. Except for HS-MW-17, where the soil encountered was sand from ground surface to an elevation of approximately 560 feet above mean sea level, fine-grained soil was encountered in all boreholes on this cross-section, with thickness ranging from less than 10 to approximately 80 feet. However, water bearing units were encountered in all wells on the cross-section. The presence of fine-grained soil is expected to affect the flow path locally, but not the primary groundwater flow toward the Rogue River or the Grand River.

Cross-section D-D' is located east of the Rogue River, near the confluence to the Grand River, where proglacial outwash is present. The lithologies of the wells on cross-section D-D' are generally coarse-grained soil, sand or gravel, with the presence of clay of limited thickness in a few boreholes. It is consistent with the regional geology.

Cross-section E-E' is constructed from the HSDS toward the Freska Lake area. The lithologies of the boreholes are similar to cross-section A-A' and cross-section B-B'. Coarse-grained soils are generally predominant. Fine-grained soils are present in some boreholes in thickness ranging from less than 10 to approximately 70 feet. However, water bearing units were encountered in all of these wells.

In general, coarse-grained soil predominates in most of the soil borings and water well logs in the HSDS study area. The presence and thickness of clay and silt deposits varies horizontally and vertically without stratified correlation between borings. The lithologies shown on the cross-sections in the HSDS study area are characteristics of glacial outwash, and end moraines, to a lesser extent, as documented in regional geology.

Wolven/Jewell Study Areas

Cross-section F-F' is constructed from the Wellington Ridge neighborhood to the Wolven Northeast study area. Fine-grained soil, clay, or silt is predominant in the boreholes on cross-section F-F'. Water bearing units were encountered below the clay stratum or between clay strata. The thickness of fine-grained soil varies from approximately 20 to more than 100 feet. In most of the boreholes on cross-section F-F', the top of the clay stratum was shallow, except the well at 3616 11 Mile Road, where more than 100 feet of sand were present above the top of the clay stratum, presenting a potential pathway for surface/shallow contamination to migrate to the deeper zone.

Cross-sections G-G' and H-H' are located from the Wellington Ridge area to the west or northwest toward the portions of the study area located west of US-131. For the boreholes located east of US-131, fine-grained soil is predominant in the boreholes while, for the boreholes located west of US-131, more coarse-grained soil is present. The thickness of fine-grained soil varies from less than 10 to more than 100 feet. Similar to cross-section F-F', water bearing units were encountered below the clay stratum or between clay strata.

Cross-section I-I' is constructed from the Wellington Ridge area to the southeast toward the Rogue River. Fine-grained soil, clay, or silt is generally predominant in the boreholes on cross-section I-I. The fine-grained soil

strata observed in the borings from 3260 Bent Tree Ridge to 8497 Windstone Road are not as thick when compared to other borings in the NKSA. Overall, the thickness of fine-grained soil varies from approximately 10 to approximately 200 feet. Water bearing units were encountered below the clay stratum or between clay strata.

In general, fine-grained soil predominates in most of the soil borings and water well logs in the Wolven/Jewell study area. In the soil borings located west of US-131 or closer to the Rogue River, coarse-grained soils are present in greater thickness and are even dominant in some locations. In addition, individual borings containing only coarse-grained soil exist even in the areas where fine-grained soils are predominant. These locations provide potential migration pathways from the surface/shallow to the deeper zone. The presence and thickness of clay and slit deposits varies horizontally and vertically. They appear to be unstratified and discontinuous in the area. In the soil borings where fine-grained soils are predominant, water bearing units were encountered below the clay stratum or between clay strata. In rare cases, water wells were screened in the bedrock. The lithologies shown on the cross-sections in the Wolven/Jewell study area are characteristic of end moraines as documented in regional geology. The presence of a relatively large volume of fine-grained soil limits the hydraulically conductive saturated zone, and therefore affects groundwater flow and contaminant transport pathway.

## 2.10 GROUNDWATER FLOW

Static water levels were collected from the monitoring wells and the staff gauges. Groundwater and surface water elevations were calculated from the surveyed elevations of the top of casing for the monitoring wells or reference points for the staff gauges. In addition, surface water elevations recorded at USGS04118500 were also downloaded and converted to the same datum as the monitoring well survey. See **Table 2** for a summary of the static groundwater water level measurements.

In addition to the R&W/GZA installed groundwater monitoring wells, EGLE also collected static water level data from the monitoring wells installed by EGLE during the November 2019 monitoring event, and requested North Kent County Landfill collect and provide static water level data in November 2019. In combination, the November 2019 static water level data provided the most complete set of static water levels and elevations for the NKSA.

For the locations where multiple wells were installed at different intervals, R&W/GZA grouped the wells into shallow and deep aquifers by borehole lithologies, screen intervals, and static water elevations. See **Table 1** for the well grouping designations.

Based on the November 2019 data set, groundwater elevation contours were interpolated from the static water level data. See **Figure 13** for the groundwater elevation contours in the shallow zone and **Figure 14** for the deep zone.

As shown on **Figure 13**, groundwater in the NKSA flows to the Rogue River. The HSDS is situated at or near a groundwater divide. Groundwater predominantly flows from the HSDS to the southeast to the Rogue River. But a portion of the flow is to the northwest. Because of Freska Lake and Clear Bottom Lake, the hydraulic gradient to the southwest appears to be flat as compared to the southeast. The Wellington Ridge is situated at a groundwater mounding area, and groundwater flows to the northwest, north, northeast and southeast. The hydraulic gradient in the Wolven/Jewell area appears to be steep due to the presence of relatively significant volumes of fine-grain soil.

As shown on **Figure 14**, the deep zone groundwater contours are similar to the shallow zone with a few localized variations. Groundwater flow directions are generally similar to the shallow zone as well.

## 2.11 PFAS DISTRIBUTION IN GROUNDWATER

PFAS analytical data from the groundwater monitoring wells, VAP samples, and residential water well samples collected until December 2019 were combined and used for the interpolation of isoconcentration maps. Where data from multiple sampling depths or sampling events are available at one location, the maximum concentrations were used during interpolation. It is important to note that the isoconcentration maps were geostatistically interpolated from spatially distributed point data; therefore, they may overestimate the concentrations or extents in areas where data points were relatively sparse. As implied by the method, the isoconcentration maps are estimations only and are not intended to represent measured or true conditions. **Figures 15, 16,** and **17** present the interpolated isoconcentration maps for total PFOS, PFOA and PFAS, respectively. Analytical data for the groundwater monitoring wells are provided on **Tables 3** and **4**.

PFAS isoconcentration map indicated PFAS migrated from the HSDS toward the Rogue River, primarily in the southeast direction, along the plume centerline. A portion of the PFAS plume appeared to migrate from the HSDS to the northwest toward the Freska Lake area and the Rogue River, but the plume transport appeared to be slowed as the plume reached the area of the Freska Lake and Clear Bottom Lake, where the groundwater gradient is relatively flat and groundwater flow pattern is affected by the surface water bodies. The PFAS isoconcentration map also indicated a PFAS plume with relatively low concentration near the confluence of the Rogue River and the Grand River.

In the Wolven/Jewell study areas, the PFAS isoconcentration map indicated that PFAS-containing groundwater migrated from the Wellington Ridge neighborhood, where PFOS, PFOA, and total PFAS were detected, to the Wolven Northeast study area, the Wolven Northwest study area, and the North Childsdale area. Based on the groundwater flow evaluation, the PFAS-impacted groundwater is expected to continue migrating to the Rogue River from these areas. It is important to note that the PFAS isoconcentration extent at the northeast corner of US-131 and 10 Mile Road and southwest of the Wellington Ridge neighborhood was a result of interpolation, due to lack of data points in that area.

The PFOA and PFOS isoconcentration maps indicated a similar distribution to the total PFAS isoconcentration map, but their extents and the concentration ranges are less than that of total PFAS because the total PFAS isoconcentration map included other detected compounds, such as PFBS, PFHxA, PFHxS, and PFNA. Furthermore, the mapping indicates distribution of lower chain compound such as PFBS is spatially greater than PFOS and PFOA, likely due to its relatively low sorption coefficient to soil matrix[3]. In comparison, the extent of PFOS distribution isoconcentration map is slightly less than that of PFOA, likely because PFOS has eight fluorine atoms in the tail, and PFOA has seven fluorine atoms in the tail, and the longer chain PFOS is more strongly sorbed to the soil matrix than PFOA[4].

## 2.12 GSI AND APPLICABLE RULE 57 WATER QUALITY STANDARDS

The groundwater flow evaluation and total PFAS, PFOS and PFOA distribution analysis indicate that PFOA and PFOS have migrated toward the Rogue River or will migrate toward the Rogue River. Based on EGLE's Part 201 Administrative Rules, Part 31 Administrative Rules, Part 4 – Water Quality Standards, the potential environmental

[3] See Section 5.2.3: https://pfas-1.itrcweb.org/5-environmental-fate-and-transport-processes/#5_2
[4] See Section 5.2.3: https://pfas-1.itrcweb.org/5-environmental-fate-and-transport-processes/#5_2

exposure pathways for impacted surface water in the Rogue River and applicable Part 4 Rule 57 Water Quality Values are identified as follows:

- Human exposure via non-drinking water exposure route – Rule 57 HNDV;
- Aquatic life exposure to impacted water in the Rogue River – Rule 57 FCV; and
- Wildlife exposure to impacted water in the Rogue River – Rule 57 WV.

The generic Part 201 GSI criteria are the lesser of HNDV, FCV, and WV. It is important to note that the human health drinking water value is not applicable.

| Parameter | Units | HNDV | FCV | WV |
|---|---|---|---|---|
| PFOA | ng/L | 12,000 | 880,000 | Not Available |
| PFOS | ng/L | 12 | 140,000 | Not Available |

### 2.13 DATA GAPS

Based on the flow and total PFAS, PFOS and PFOA distribution assessment, the following locations are identified as potential discharge areas for the PFOS- and PFOA-containing groundwater in the HSDS and Wolven-Jewell study areas:

- Southeast downgradient of the HSDS primary plume;
- Downgradient of the HSDS, near the confluence of the Rogue River and the Grand River;
- Downgradient of the HSDS, near the Freska Lake area;
- Wolven Northeast study area;
- Wolven Northwest study area; and
- North Childsdale study area, downgradient of the Wolven study area.

In evaluating the potential risks to the Rogue River, the following data gaps are identified:

- Groundwater elevation and flux at the GSI to evaluate whether groundwater discharges to the Rogue River;
- Groundwater elevation and flux data at the GSI to evaluate the gradient and flux at the GSI, if it is determined groundwater discharges to the Rogue River;
- PFOS, PFOA and PFAS concentrations of the groundwater discharging to the Rogue River; and
- Identification of the proper locations for GSI monitoring wells.

## 3.0 PROPOSED STATEMENT OF WORK

The following provides a summary of the proposed investigations, based on the identified data gaps. The proposed sampling locations are shown on **Figure 18**. Actual piezometer and pore-water sampling locations may vary slightly from the proposed locations of **Figure 18** during installation. While the target locations are shown, limitations for access on private properties, river bank conditions, and utilities may require moving piezometer locations.

## 3.01 HSDS STUDY AREA

Based on the groundwater flow, analytical data, and our evaluation, the following pore-water sampling and GSI piezometer locations are proposed:

- Nine pore-water sampling locations (HS-PW-1 through HS-PW-9) and five GSI piezometer locations (HS-GSI-1 through HS-GSI-5) downgradient of the primary House Street plume, along the Rogue River, to monitor potential PFOA and PFOS venting to the surface water.
- Three GSI piezometer locations (HS-GSI-6 through HS-GSI-8) downgradient of the primary House Street plume, along the Grand River, to measure potential venting to the surface water.
- Two pore-water sampling locations (HS-PW-10 and HS-PW-11) and one GSI piezometer location (HS-GSI-9) northwest of the House Street Site, downgradient of the Freska Lake area, along the Rogue River, to monitor potential PFOA and PFOS venting to the surface water.

In addition, existing well cluster HS-MW-19S/D and HS-MW-29A (located hydraulically downgradient of the primary House Street plume) are also considered to be GSI monitoring points to monitor potential PFOA and PFOS venting to the Rogue River. As identified in the GSI SOW, these wells will be sampled during the pore-water sampling event.

## 3.02 WOLVEN/JEWELL STUDY AREA

Based on the groundwater flow, analytical data, and our evaluation, the following pore-water sampling and GSI piezometer locations are proposed:

- Seven pore-water sampling locations (Area19-PW-1 through Area19-PW-7) downgradient/northeast of the Area 19 plume within the Rogue River to monitor potential venting to the surface water. These pore-water sample locations are located hydraulically downgradient of Wellington Ridge, immediately downgradient of the apparent extent of PFOA+PFOS exceeding 10 ng/L.
- Three GSI piezometer locations (Area19-GSI-1 through Area19-GSI-3) downgradient of the Area 19 plume to the northeast. Staff gauges (as shown on **Figures 18** and **18B**) in the river will be paired with these piezometer locations. These locations along the Rogue River will be used to measure and compare the groundwater elevations to the pore-water and surface-water elevations. In addition, these locations will to be used to monitor potential venting to the surface water at the north and south edges of this portion of the plume along with the center of the plume. As identified in the GSI SOW, these piezometers will be sampled during the pore-water sampling event. Additionally, one existing well installed by EGLE (DEQ-MW-9 well series) is also considered to be a GSI monitoring point.

- Four pore-water sampling locations (WVNW-PW-1 through WVNW-PW-4) and two GSI piezometer locations (WVNW-GSI-1 through WVNW-GSI-2) immediately downgradient of the Wolven Northwest plume, along the Rogue River to monitor potential PFOA and PFOS venting to the surface water. Two staff gauges (as shown on **Figures 18** and **18A**) in the river will be paired with these two piezometer locations.
- Six pore-water sampling locations (WV/CH-PW-1 through WV/CH-PW-6) and two GSI piezometer locations (WV/CH-GSI-1 through WV/CH-GSI-2) are proposed immediately downgradient/southeast of the Wolven-North Childsdale plume, along the Rogue River to monitor potential venting to the surface water. The existing staff gauges in this segment of the Rogue River will be utilized for water level comparison and groundwater flow evaluation.

## 4.0 INVESTIGATION METHODOLOGY

Pore-water sampling will be performed using the same techniques previously used at the former Wolverine Tannery site. Therefore, two weeks of piezometer- and staff-gauge measurements will be made to establish groundwater flows to the surface water before any pore-water samples will be collected. Piezometer- and staff-gauge measurements will be made Monday, Wednesday, and Friday of each week. If these measurements do not demonstrate groundwater flow to the River, the two-week monitoring will be repeated until it does. The lack of demonstration and need to extend the monitoring period will be discussed with EGLE, if needed.

Relevant tasks completed under this RAP will be completed in accordance with the most recent revision of the QAPP prepared for Wolverine by R&W/GZA.

### 4.01 PIEZOMETERS INSTALLATION AND SAMPLING

The proposed piezometers will be hand-driven into the groundwater on the river bank. The top of the piezometer will be installed above the estimated flood elevation based on observations of vegetation and deposition. The piezometer will be finished with a one-foot-thick bentonite seal, followed by a two-inch concreate pad at the surface. An elevational survey will also be conducted upon completion of the piezometer installations.

The piezometers will be installed following SOP A28 (**Appendix B**). Piezometers slated for sampling as established in the GSI SOW (Area19-GSI-1 through Area19-GSI-3) will be sampled following SOP A29 (**Appendix B**). These piezometers will be sampled a minimum of two weeks after installation and in conjunction with the pore-water sampling event in this RAP.

### 4.02 PORE-WATER SAMPLING

After demonstrating the groundwater is flowing to the River, pore-water samples will be collected using a temporary well point (i.e., stainless-steel probe) driven to discrete depths within the river bottom. A shroud may be used if river bottom conditions allow, to further minimize any short-circuiting during pore-water sampling. The pore-water sampling will be attempted at 6-inch intervals beginning at 12 inches below the surface of the bottom sediment. Two pore-water samples will be attempted following procedures similar to that described below. R&W/GZA's experience indicates that pore-water sampling methodology can vary from sampling location to location given physical conditions of the stream bed, etc. Step outs may be necessary if refusal is encountered. These will be documented in the field. As such, the following is proposed only as a guide.

- A 6-foot (or appropriate length) stainless-steel probe with a 6-inch screen will be advanced to the desired depth. The top of the screen in the shallowest depth interval will be 12 inches below the surface of the sediment in the river bottom. Screen intervals are expected to be: 12 to 18 inches and 18 to 24 inches.
- A peristaltic pump with dedicated tubing will be used to purge the screen at a flow rate less than 100 ml/min.
- Using a multiparameter meter (as specified in the QAPP) with a flow-through cell, R&W/GZA will measure pH, temperature, conductivity, dissolved oxygen and ORP from the pore-water interval and will compare it to measurements collected concurrently from the river. Both readings will be documented on a field data sheet. DO and ORP will be collected for information purposes only.
- Once the field readings from the pore water have stabilized and the pore-water readings are distinguishable from the river readings (i.e., >10% difference for parameters except for temperature), the pore water will be sampled.

- Pore water will be pumped directly into laboratory-provided sampling containers maintaining the flow rate of less than 100 ml/min. R&W/GZA will submit samples to Pace Analytical of Columbia, South Carolina for PFAS analysis using the DoD QSM (which includes isotope dilution.)
- This is further detailed in SOP A27 (**Appendix B**).

## 5.0 SAMPLING AND ANALYTICAL PROCEDURES

This section provides a generalized SAP for the piezometer- and pore-water sampling. Specific information regarding sampling procedures and analytical methods is provided in the site-specific QAPP.

### 5.01 SAMPLING LOCATIONS

As discussed in **Section 3.0**, the following pore-water sampling and GSI piezometer locations are proposed:

| Area of Investigation | Pore Water | Piezometers | Wells |
|---|---|---|---|
| Southeast downgradient of the HSDS primary plume along Rogue River | HS-PW-1 through HS-PW-9 | HS GSI-1 through HS-GSI-5 | HS-MW-19S/D and HS-MW-29A |
| Downgradient of the HSDS near Grand River | -- | HS-GSI-6 through HS-GSI-8 | -- |
| Northwest of the HSDS, Downgradient of the Freska Lake area | HS-PW-10 and HS-PW-11 | HS-GSI-9 | -- |
| Downgradient of Wolven Northeast plume within the Rogue River | Area19-PW-1 through Area19-PW-7 | Area19-GSI-1 through Area19-GSI-3, paired staff gauges | One EGLE well (DEQ-MW-9 well series) |
| Downgradient of the northwest portion of the Wolven/Jewell plume along the Rogue River | WVNW-PW-1 through WVNW-PW-4 | WVNW-GSI-1 through WVNW-GSI-2, paired staff gauges | |
| North Childsdale area, downgradient of the Wolven study area | WV/CH-PW-1 through WV/CH-PW-6 | WV/CH-GSI-1 through WV/CH-GSI-2, existing staff gauges | |

### 5.02 SAMPLE COLLECTION AND LABELING

Samples will be collected for PFAS analysis following the methods summarized in **Section 4.0** and detailed in the sampling SOPs for Pore Water, Piezometers, and Groundwater Monitoring Wells provided in **Appendix B**. Detailed field and laboratory requirements are provided in the site-specific QAPP.

Sample identification will consist of nomenclatures that include the unique location identification (see reference table above). If applicable, sample identification for each sample will be repeated for each sampling event with consistent spelling.

To prevent misidentification of samples, legible labels will be affixed to each sample container. The labels will be sufficiently durable to remain legible even when wet. At a minimum, the labels will contain the following information:

- Location ID;
- Name or initials of collector; and
- Date and time of collection.

5.03 SAMPLE SHIPPING

Sample bottles will be placed into the cooler and packed with double-bagged wet ice immediately following collection. Packing material will be used as necessary. A temperature blank will be placed in the cooler prior to shipment. The cooler shall be addressed to the appropriate laboratory and dispatched as soon as practical to ensure timely arrival.

5.04 ANALYTICAL METHOD AND PARAMETERS

PFAS will be analyzed using DoD QSM 5.3 guidelines for PFAS by isotope dilution methodology. The analyte list will include the 28 PFAS compounds specified by EGLE, and reporting limits are provided in Table A.7.7 of the project-specific QAPP.

## 6.0 DATA QUALITY ASSURANCE AND CONTROL

The following field quality control samples will be collected at a rate of one per 20 samples in accordance with the project-specific QAPP: Field blanks, field duplicates, and MS/MSDs.

- Field blanks will be collected by pouring laboratory-supplied certified PFAS-free water into a sample container at the point of sample collection. The purpose of field blanks is to assess potential contamination at the sample point.

- Field duplicates will be collected by filling one additional sample container with water from the sample point. The purpose of field duplicates is to assess variability in sample composition. Field duplicates are not intended to be blind duplicates.

- MS/MSD will be collected by filling two additional sets of sample bottles with water from the sample point. MS/MSD analyses are conducted by the analytical laboratory after samples have been collected and submitted. Analysis of known concentrations of analytes spiked in the MS/MSD samples indicate if matrix interference effects are occurring.

- QA/QC samples will be collected using the methods described in **Section 5.0** and the SOPs in **Appendix B**. Samples will be labeled described in **Section 5.0.** The location of QA/QC samples will be entered into the Monitoring Checklist. QA/QC samples will be analyzed using the same analytical methods used for the primary sample.

## 7.0 INVESTIGATION DERIVED WASTE

Pore-water pumped during the sampling and development and sampling purge water from the piezometers and monitoring wells are the only investigation derived wastes anticipated. The pumped water from sampling for pore water will be discharged back to the surface water body after the PFAS aliquot is collected. The piezometer and monitoring well development and purge water will managed as follows:

- For locations where PFAS concentrations are below Part 201 GRCC, the water can be discharged to the ground surface in accordance with EGLE interoffice communication regarding purge-water disposal from well sampling and development (EGLE, 1999).

- For locations where PFAS concentrations are unknown or known to exceed Part 201 GRCC, the water will be disposed of appropriately in accordance with the EGLE interoffice communication regarding purge water disposal from well sampling and development (EGLE, 1999), and not discharged to the ground surface.

## 8.0 ANTICIPATED SCHEDULE

The schedule for piezometer installation will depend greatly on R&W/GZA's ability to procure access to the desired locations and the potential impact of coronavirus disease 2019 (COVID-19). Piezometers will be installed and developed prior to collecting the two weeks of piezometer- and staff-gage measurements. After demonstrating groundwater flow toward the Rogue River, the pore-water sampling will be conducted. Assuming access for all piezometers and river access is obtained expeditiously and there are no COVID-19-related delays, R&W/GZA currently anticipates collecting pore-water samples during fall 2020 low-flow conditions (through early October). If access issues do arise, the protocol laid out in **Section 9.0** of the CD will be implemented.

R&W/GZA will summarize the findings from this investigation and submit a work plan for installation of permanent monitoring well locations needed for GSI monitoring within 90 days following receipt of all analytical data.

## 9.0 REFERENCES

Apple, Beth A. and Howard W. Reeves. 2007. *Summary of Hydrogeologic Conditions by County for the State of Michigan*. https://pubs.usgs.gov/of/2007/1236/pdf/OFR2007-1236.pdf.

Farrand, W.R. 1982. *Quaternary Geology of Michigan.* http://www.michigan.gov/documents/deq/1982_Quaternary_Geology_Map_301467_7.pdf.

Michigan Department of Environmental Quality. 1987. *Bedrock Geology Map of Michigan*. 1:500,000 scale. https://www.michigan.gov/documents/deq/1987_Bedrock_Geology_Map_301466_7.pdf.

Michigan Department of Environmental Quality, Water Bureau, United States Geological Survey Michigan Water Science Center, and Michigan State University – Institute of Water Research, RS&GIS, and Biosystems and Agricultural Engineering. 2005. Wellogic – Statewide Wells Groundwater Inventory and Mapping Project (Michigan State University, 2005a).

Michigan Department of Environmental Quality. 1999. *Interoffice Communication, Operation Memo Gen-10*, *Re: Purge Water Disposal from Well Sampling and Development.* https://www.michigan.gov/documents/deq/deq-whm-hwp-Op-Memo-Gen-10-Rev1_235127_7.pdf

Michigan State University. 2015. Groundwater Inventory and Mapping Project. Michigan Glacial Landsystems.

Michigan State University. 2005, June 30. Groundwater Inventory and Mapping Project. Estimate of Annual Groundwater Recharge. (Michigan State University, 2005b)

Michigan State University. 2005, October 28. Groundwater Inventory and Mapping Project Glacial Deposits - Estimated Transmissivity. Lansing, Michigan, United States of America (Michigan State University 2005c).

Michigan State University. 2005, June 30. Groundwater Inventory and Mapping Project Wellogic - Well Hydraulic Properties. Lansing, Michigan, United States of America (Michigan State University, 2005d).

Michigan State University. 2005, June 30. Groundwater Inventory and Mapping Project Wellogic -Statewide Wells. Lansing, Michigan, United States of America.

R&W/GZA. 2018. *Conceptual Site Model Update and Status Report, Former House Street Disposal Area, Wolverine World Wide, Inc., Rockford, Michigan*.

R&W/GZA. 2019. *Implementation of 2018 Work Plan - Summary Report, Former Wolverine World Wide Tannery Facility*. Submitted to USEPA January 11, 2019.

Stramel, G.J., C.O. Wisler, and L.B. Laird. 1954. *Water Resources of the Grand Rapids Area, Michigan.* https://pubs.usgs.gov/circ/1954/0323/report.pdf.

Western Michigan University. (1981). Hydrogeologic Atlas of Michigan: U.S. Environmental Protection Agency Underground Injection Control Program. Kalamazoo, Michigan, United States of America.

# TABLES

**TABLE 1**
EXISTING MONITORING WELL CONSTRUCTION INFORMATION
Algoma and Plainfield Townships, Kent County, MI

| Site Location | Well Ownership/ Data Provider | Well Field ID | Top of Casing Elevation (ft) | Ground Surface Elevation (ft) | Top of Screen Depth (ft bgs) | Bottom of Screen Depth (ft bgs) | Casing Diameter (in) | Casing Type | Aquifer Zone | Protective Casing Type |
|---|---|---|---|---|---|---|---|---|---|---|
| House Street | EGLE | HS-DEQ-MW1D | 799.43 | 799.7 | *ND* | 123.82 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW1I | 799.83 | 800.2 | *ND* | 77.58 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW1S | 799.42 | 799.7 | *ND* | 56.56 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW3D | 857.29 | 857.9 | *ND* | 177.41 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW3S | 857.40 | 857.9 | *ND* | 106.45 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW4-102 | 733.80 | 734.4 | *ND* | 102.8 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW4-16 | 734.23 | 734.7 | *ND* | 16.04 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW4-53 | 734.33 | 734.7 | *ND* | 53.85 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW4-80 | 734.33 | 734.7 | *ND* | 80.09 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW4-85 | 733.61 | 734.4 | *ND* | 85.79 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW4-90 | 733.99 | 734.4 | *ND* | 89.68 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW4-97 | 733.71 | 734.4 | *ND* | 98.81 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW5D | 812.95 | 813.5 | *ND* | 130.16 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW5S | 813.12 | 813.5 | *ND* | 47.28 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW6D | 795.59 | 796.4 | *ND* | 176.36 | *ND* | *ND* | *D* | *ND* |
| House Street | EGLE | HS-DEQ-MW6S | 796.09 | 796.4 | *ND* | 45.71 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW7-102 | 775.04 | 775.4 | *ND* | 102.11 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW7-33 | 775.15 | 775.4 | *ND* | 33.33 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW7-87 | 775.02 | 775.4 | *ND* | 87.71 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW7-94 | 775.16 | 775.4 | *ND* | 94.32 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW8D | 677.86 | 678.2 | *ND* | 33.37 | *ND* | *ND* | *S* | *ND* |
| House Street | EGLE | HS-DEQ-MW8S | 677.87 | 678.2 | *ND* | 28.28 | *ND* | *ND* | *S* | *ND* |
| House Street | R&W/GZA | HS-MW-10D | 780.94 | 778.1 | 188.2 | 193.2 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-10M | 780.64 | 777.7 | 126.4 | 131.4 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-10S | 780.06 | 777.2 | 48.3 | 58.3 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-11D | 744.75 | 742.1 | 153.6 | 158.6 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-11M | 744.96 | 742.3 | 96.4 | 101.4 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-11S | 744.78 | 742.1 | 21.2 | 31.2 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-12A | 716.50 | 716.8 | 15.4 | 20.4 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-12B | 716.36 | 716.8 | 51.5 | 56.5 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-12C | 716.17 | 716.9 | 127.7 | 132.7 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-12D | 716.48 | 717.0 | 158.7 | 163.7 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-12E | 716.29 | 716.8 | 187.5 | 192.5 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-13A | *ND* | *ND* | 79.0 | 84.0 | 2 | PVC | ND | *ND* |
| House Street | R&W/GZA | HS-MW-13B | *ND* | *ND* | 149.0 | 154.0 | 2 | PVC | ND | *ND* |
| House Street | R&W/GZA | HS-MW-13C | *ND* | *ND* | 199.5 | 114.5 | 2 | PVC | ND | *ND* |
| House Street | R&W/GZA | HS-MW-14D | 673.20 | 670.7 | 109.0 | 114.0 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-14M | 673.53 | 671.0 | 68.1 | 73.1 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-14S | 673.64 | 671.2 | 13.0 | 23.0 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-15D | 642.86 | 639.7 | 108.6 | 118.6 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-15M | 640.98 | 638.0 | 44.8 | 49.8 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-15S | 640.71 | 637.5 | 6.9 | 16.9 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-17D | 784.64 | 782.3 | 222.1 | 227.1 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-17M | 784.17 | 781.9 | 167.3 | 172.3 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-17S | 784.77 | 782.0 | 105.8 | 110.8 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-18D | 684.73 | 682.0 | 140.6 | 145.6 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-18S | 683.93 | 682.0 | 12.8 | 22.8 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-19D | 680.79 | 677.7 | 85.9 | 95.9 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-19S | 680.83 | 677.8 | 58.4 | 61.4 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-1D | 790.73 | 788.7 | 172.3 | 176.9 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-1S | 791.01 | 788.8 | 67.4 | 72.1 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-20D | 706.64 | 703.9 | 126.1 | 131.1 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-20M | 706.90 | 704.2 | 101.5 | 106.5 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-20S | 706.72 | 703.9 | 61.1 | 66.1 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-21D | 648.38 | 645.7 | 76.2 | 86.2 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-21M | 648.85 | 645.9 | 59.0 | 64.0 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-21S | 648.67 | 645.8 | 9.8 | 19.8 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-23A | 791.23 | 791.7 | 72.1 | 77.1 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-23B | 791.21 | 791.5 | 137.9 | 142.8 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-23C | 791.09 | 791.4 | 210.2 | 215.0 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-23D | 791.47 | 792.0 | 238.9 | 243.9 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-24A | 776.01 | 776.3 | 55.6 | 60.4 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-24B | 775.72 | 776.2 | 225.2 | 230.0 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-25D | 650.61 | 651.1 | 65.7 | 70.7 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-25S | 650.83 | 651.2 | 51.1 | 56.1 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-26D | 651.75 | 652.1 | 79.6 | 84.6 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-26M | 651.31 | 651.7 | 61.7 | 66.7 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-26S | 651.88 | 652.0 | 25.8 | 30.8 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-27A | 668.44 | 668.7 | 21.6 | 26.2 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-27B | 668.49 | 668.9 | 35.4 | 38.0 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-27C | 668.64 | 669.0 | 41.3 | 45.9 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-27D | 668.54 | 668.9 | 52.4 | 56.4 | 2 | PVC | D | Flush |

**TABLE 1**
EXISTING MONITORING WELL CONSTRUCTION INFORMATION
Algoma and Plainfield Townships, Kent County, MI

| Site Location | Well Ownership/ Data Provider | Well Field ID | Top of Casing Elevation (ft) | Ground Surface Elevation (ft) | Top of Screen Depth (ft bgs) | Bottom of Screen Depth (ft bgs) | Casing Diameter (in) | Casing Type | Aquifer Zone | Protective Casing Type |
|---|---|---|---|---|---|---|---|---|---|---|
| House Street | R&W/GZA | HS-MW-27E | 668.56 | 668.9 | 58.5 | 62.5 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-28A | 665.88 | 666.2 | 39.1 | 43.7 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-28B | 666.14 | 666.4 | 43.3 | 47.9 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-28C | 666.16 | 666.5 | 49.2 | 53.8 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-28D | 665.89 | 666.3 | 62.2 | 66.8 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-28E | 665.61 | 666.0 | 82.7 | 87.3 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-29A | 633.13 | 630.3 | 3.5 | 13.5 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-29B | 633.89 | 630.5 | 16.8 | 21.8 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-29C | 633.60 | 630.4 | 27.2 | 32.2 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-29D | 633.19 | 630.7 | 37.1 | 42.1 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-2S | 799.66 | 797.6 | 77.9 | 82.5 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-30A | 672.78 | 673.0 | 46.9 | 51.5 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-30B | 673.09 | 673.4 | 51.5 | 56.1 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-30C | 672.90 | 673.1 | 77.4 | 82.0 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-30D | 673.37 | 673.6 | 112.7 | 117.3 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-30E | 672.32 | 672.9 | 123.2 | 127.7 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-31A | 639.30 | 639.5 | 17.1 | 21.6 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-31B | 639.27 | 639.3 | 26.0 | 30.5 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-31C | 639.27 | 639.4 | 41.3 | 45.8 | 2 | PVC | S | Flush |
| House Street | R&W/GZA | HS-MW-31D | 638.96 | 639.1 | 48.8 | 53.4 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-31E | 638.95 | 639.2 | 64.1 | 68.7 | 2 | PVC | D | Flush |
| House Street | R&W/GZA | HS-MW-32A | 727.36 | 724.8 | 60.9 | 65.5 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-32B | 727.85 | 725.1 | 79.1 | 83.7 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-32C | 727.72 | 725.1 | 108.8 | 113.4 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-32D | 727.55 | 725.0 | 142.3 | 146.9 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-3P | 790.15 | 787.7 | 19.3 | 24.3 | 2 | PVC | P | Stickup |
| House Street | R&W/GZA | HS-MW-3S | 790.69 | 788.1 | 70.1 | 75.0 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-4S | 784.88 | 782.3 | 70.2 | 74.8 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-5D | 781.99 | 779.3 | 190.5 | 200.5 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-5P | 781.55 | 779.1 | 17.7 | 22.4 | 2 | PVC | P | Stickup |
| House Street | R&W/GZA | HS-MW-5S | 781.79 | 779.2 | 60.3 | 65.0 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-6D | 773.44 | 771.0 | 157.5 | 162.5 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-6S | 773.34 | 770.7 | 58.2 | 62.9 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-7S | 791.09 | 788.9 | 69.9 | 74.5 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-8 | 745.09 | 742.2 | 30.0 | 35.0 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-9D | 820.88 | 818.2 | 204.3 | 209.3 | 2 | PVC | D | Stickup |
| House Street | R&W/GZA | HS-MW-9M | 820.66 | 817.9 | 126.8 | 131.8 | 2 | PVC | S | Stickup |
| House Street | R&W/GZA | HS-MW-9S | 820.20 | 817.8 | 26.2 | 31.2 | 2 | PVC | P | Stickup |
| North Kent Landfill | NKL | NKLF-MW-35 | 900.23 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-48 | 901.64 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-53 | 893.99 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-54 | 912.79 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-55 | 893.11 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-56 | 867.88 | 866.4 | *ND* | 43.97 | *ND* | *ND* | *S* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-57 | 894.35 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-60 | 844.35 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-61 | 841.14 | 839.8 | *ND* | 28.47 | *ND* | *ND* | *S* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-63 | 840.81 | 839.1 | *ND* | 102.41 | *ND* | *ND* | *D* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-65 | 835.27 | 834.2 | *ND* | 21.87 | *ND* | *ND* | *S* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-66 | 874.57 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-67 | 902.72 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-68 | 900.98 | 899.2 | *ND* | 92.79 | *ND* | *ND* | *S* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-69 | 893.04 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-70 | 897.8 | 895.6 | *ND* | 63.33 | *ND* | *ND* | *S* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-71 | 894.71 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-72 | 882.18 | 879.5 | *ND* | 26.98 | *ND* | *ND* | *S* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-73 | 900.19 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-74 | 880.34 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-75 | 881.23 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-76 | 849.47 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-77 | 837.14 | 834.2 | *ND* | 22.8 | *ND* | *ND* | *S* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-78 | 883.89 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-80 | 888.05 | 887.4 | *ND* | 42.44 | *ND* | *ND* | *S* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-81 | 834.71 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-MW-82 | 896.26 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-TW-02 | 900.95 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-TW-04 | 858.20 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-TW-05 | 838.64 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| North Kent Landfill | NKL | NKLF-TW-06 | 883.99 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| Wolven | EGLE | WV-DEQ-MW10-121 | 764.74 | 763.865 | *ND* | 120.72 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW10-177 | 764.934 | 763.865 | *ND* | 177.63 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW10-55 | 764.909 | 763.376 | *ND* | 55.21 | *ND* | *ND* | *S* | *ND* |

**TABLE 1**
EXISTING MONITORING WELL CONSTRUCTION INFORMATION
Algoma and Plainfield Townships, Kent County, MI

| Site Location | Well Ownership/ Data Provider | Well Field ID | Top of Casing Elevation (ft) | Ground Surface Elevation (ft) | Top of Screen Depth (ft bgs) | Bottom of Screen Depth (ft bgs) | Casing Diameter (in) | Casing Type | Aquifer Zone | Protective Casing Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Wolven | EGLE | WV-DEQ-MW10-84 | 764.442 | 763.376 | *ND* | 84.14 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW10-95 | 764.931 | 763.376 | *ND* | 95.25 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW11-130 | 859.121 | 855.95 | *ND* | 130.22 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW11-137 | 859.212 | 855.763 | *ND* | 136.65 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW11-145 | 859.14 | 855.95 | *ND* | 145.71 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW11-57 | 858.794 | 855.95 | *ND* | 56.99 | *ND* | *ND* | *S* | *ND* |
| Wolven | EGLE | WV-DEQ-MW11-95 | 859.129 | 855.763 | *ND* | 95.47 | *ND* | *ND* | *S* | *ND* |
| Wolven | EGLE | WV-DEQ-MW2D | 877.53 | 877.80 | *ND* | 168.72 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW2S | 877.57 | 877.80 | *ND* | 58.04 | *ND* | *ND* | *S* | *ND* |
| Wolven | EGLE | WV-DEQ-MW9-114 | 712.079 | 712.402 | *ND* | 114.07 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW9-131 | 712.031 | 712.402 | *ND* | 130.97 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW9-57 | 712.128 | 712.562 | *ND* | 56.85 | *ND* | *ND* | *ND* | *ND* |
| Wolven | EGLE | WV-DEQ-MW9-73 | 712.096 | 712.562 | *ND* | 73.34 | *ND* | *ND* | *D* | *ND* |
| Wolven | EGLE | WV-DEQ-MW9-94 | 711.979 | 712.562 | *ND* | 94.09 | *ND* | *ND* | *D* | *ND* |
| Wolven | R&W/GZA | WV-MW-1 | 859.24 | 859.2 | 137.8 | 142.8 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-10D | 751.00 | 748.6 | 165 | 170 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-10M | 751.19 | 748.7 | 69.9 | 74.9 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-10S | 751.26 | 748.4 | 7.0 | 12.0 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-11D | 735.96 | 733.0 | 158.9 | 163.9 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-11S | 735.89 | 732.8 | 29.4 | 34.4 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-12D | 771.12 | 771.4 | 179.2 | 184.2 | 2 | PVC | D | Flush |
| Wolven | R&W/GZA | WV-MW-12M | 770.75 | 771.3 | 146.6 | 151.6 | 2 | PVC | D | Flush |
| Wolven | R&W/GZA | WV-MW-12S | 771.06 | 771.3 | 75.8 | 80.8 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-13D | 823.91 | 821.3 | 58.8 | 63.8 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-13M | 823.75 | 821.6 | 18.1 | 23.1 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-13S | 823.68 | 821.3 | 1.7 | 6.7 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-14D | 872.05 | 872.3 | 142.3 | 147.3 | 2 | PVC | D | Flush |
| Wolven | R&W/GZA | WV-MW-14S | 872.18 | 872.5 | 8.9 | 13.9 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-15A | 721.25 | 721.5 | 9.0 | 14 | 2 | PVC | P | Flush |
| Wolven | R&W/GZA | WV-MW-15B | 721.07 | 721.4 | 33.1 | 38.1 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-15C | 720.84 | 721.3 | 43.7 | 48.5 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-15D | 721.09 | 721.3 | 135.1 | 137.8 | 2 | PVC | D | Flush |
| Wolven | R&W/GZA | WV-MW-16D | 823.45 | 820.9 | 91.7 | 96.7 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-16S | 823.42 | 820.9 | 17.5 | 22.5 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-2D | 791.36 | 790.5 | 30.2 | 35.2 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-2S | 793.39 | 790.6 | 20.2 | 25.2 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-3D | 823.28 | 820.7 | 57.5 | 62.5 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-3S | 823.31 | 820.6 | 5.1 | 10.1 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-4 | 854.99 | 852.5 | 130.2 | 135.2 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-5D | 865.07 | 862.0 | 68.7 | 73.7 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-5S | 865.01 | 862.1 | 61.5 | 66.5 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-6D | 786.51 | 784.1 | 99.1 | 104.1 | 2 | PVC | D | Stickup |
| Wolven | R&W/GZA | WV-MW-6S | 786.62 | 784.6 | 13.3 | 18.3 | 2 | PVC | S | Stickup |
| Wolven | R&W/GZA | WV-MW-7D | 727.36 | 727.8 | 89.5 | 94.5 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-7M | 728.19 | 728.5 | 49.9 | 54.9 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-7S | 727.61 | 728.0 | 16.1 | 21.1 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-8D | 845.81 | 846.0 | 117.2 | 122.2 | 2 | PVC | D | Flush |
| Wolven | R&W/GZA | WV-MW-8M | 845.74 | 845.9 | 60.0 | 65.0 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-8S | 845.55 | 846.0 | 30.0 | 35.0 | 2 | PVC | S | Flush |
| Wolven | R&W/GZA | WV-MW-9 | 859.86 | 857.4 | 92.3 | 97.3 | 2 | PVC | S | Stickup |

**Abbreviations**

*ND* = No data provided/ available
ft = feet
bgs = below ground surface
in = inches
NKL = Kent County North Kent Landfill
EGLE = Michigan Department of Environment, Great Lakes, and Energy
R&W/GZA = Rose & Westra, a Division of GZA
P = perched zone
S = shallow zone
D = deep zone

**Notes**

1) Elevations are provided in North American Vertical Datum of 1988 (NAVD 88).
2) North Kent Landfill elevations converted from NGVD29 to NAVD88 by R&W/GZA by subtracting 0.43 feet from provided elevation.

**TABLE 2**
STATIC WATER LEVEL MEASUREMENTS
Algoma and Plainfield Townships, Kent County, MI

| Site Location | Well Field ID | November 4, 2019 Static Water Level Elevation (ft) |
|---|---|---|
| House Street | HS-DEQ-MW1D | 739.09 |
| House Street | HS-DEQ-MW1I | 748.63 |
| House Street | HS-DEQ-MW1S | 749.96 |
| House Street | HS-DEQ-MW3D | 748.76 |
| House Street | HS-DEQ-MW3S | 839.76 |
| House Street | HS-DEQ-MW4-102 | 687.91 |
| House Street | HS-DEQ-MW4-16 | 729.17 |
| House Street | HS-DEQ-MW4-53 | 688.26 |
| House Street | HS-DEQ-MW4-80 | 688.11 |
| House Street | HS-DEQ-MW4-85 | 688.07 |
| House Street | HS-DEQ-MW4-90 | 688.00 |
| House Street | HS-DEQ-MW4-97 | 687.77 |
| House Street | HS-DEQ-MW5D | 740.83 |
| House Street | HS-DEQ-MW5S | *Dry* |
| House Street | HS-DEQ-MW6D | 650.30 |
| House Street | HS-DEQ-MW6S | *Dry* |
| House Street | HS-DEQ-MW7-102 | 751.35 |
| House Street | HS-DEQ-MW7-33 | 751.20 |
| House Street | HS-DEQ-MW7-87 | 751.33 |
| House Street | HS-DEQ-MW7-94 | 751.36 |
| House Street | HS-DEQ-MW8D | 652.76 |
| House Street | HS-DEQ-MW8S | 653.68 |
| House Street | HS-MW-10D | 734.19 |
| House Street | HS-MW-10M | 726.19 |
| House Street | HS-MW-10S | 726.18 |
| House Street | HS-MW-11D | 719.37 |
| House Street | HS-MW-11M | 719.35 |
| House Street | HS-MW-11S | 720.13 |
| House Street | HS-MW-12A | *ND* |
| House Street | HS-MW-12B | *ND* |
| House Street | HS-MW-12C | *ND* |
| House Street | HS-MW-12D | *ND* |
| House Street | HS-MW-12E | *ND* |
| House Street | HS-MW-13A | *ND* |
| House Street | HS-MW-13B | *ND* |
| House Street | HS-MW-13C | *ND* |
| House Street | HS-MW-14D | 660.09 |
| House Street | HS-MW-14M | 661.24 |
| House Street | HS-MW-14S | 656.70 |
| House Street | HS-MW-15D | 635.56 |
| House Street | HS-MW-15M | 634.13 |
| House Street | HS-MW-15S | 630.84 |
| House Street | HS-MW-17D | 689.38 |
| House Street | HS-MW-17M | 689.45 |
| House Street | HS-MW-17S | 703.64 |
| House Street | HS-MW-18D | 663.55 |
| House Street | HS-MW-18S | 670.37 |
| House Street | HS-MW-19D | 649.16 |
| House Street | HS-MW-19S | 651.59 |
| House Street | HS-MW-1D | 727.41 |
| House Street | HS-MW-1S | 728.00 |
| House Street | HS-MW-20D | 648.97 |
| House Street | HS-MW-20M | 649.07 |
| House Street | HS-MW-20S | 649.12 |
| House Street | HS-MW-21D | 638.75 |
| House Street | HS-MW-21M | 637.58 |
| House Street | HS-MW-21S | 637.79 |
| House Street | HS-MW-23A | 723.53 |
| House Street | HS-MW-23B | 723.47 |
| House Street | HS-MW-23C | 723.48 |
| House Street | HS-MW-23D | 723.45 |
| House Street | HS-MW-24A | 723.25 |
| House Street | HS-MW-24B | 723.21 |
| House Street | HS-MW-25D | 627.83 |
| House Street | HS-MW-25S | 627.93 |
| House Street | HS-MW-26D | 640.12 |
| House Street | HS-MW-26M | 639.96 |
| House Street | HS-MW-26S | 636.05 |
| House Street | HS-MW-27A | 644.51 |
| House Street | HS-MW-27B | 644.58 |
| House Street | HS-MW-27C | 645.51 |
| House Street | HS-MW-27D | 645.74 |

**TABLE 2**
STATIC WATER LEVEL MEASUREMENTS
Algoma and Plainfield Townships, Kent County, MI

| Site Location | Well Field ID | November 4, 2019 Static Water Level Elevation (ft) |
|---|---|---|
| House Street | HS-MW-27E | 645.61 |
| House Street | HS-MW-28A | 629.35 |
| House Street | HS-MW-28B | 629.37 |
| House Street | HS-MW-28C | 629.30 |
| House Street | HS-MW-28D | 630.25 |
| House Street | HS-MW-28E | 630.35 |
| House Street | HS-MW-29A | *ND* |
| House Street | HS-MW-29B | *ND* |
| House Street | HS-MW-29C | *ND* |
| House Street | HS-MW-29D | *ND* |
| House Street | HS-MW-2S | 725.55 |
| House Street | HS-MW-30A | 631.99 |
| House Street | HS-MW-30B | 632.00 |
| House Street | HS-MW-30C | 632.35 |
| House Street | HS-MW-30D | 632.53 |
| House Street | HS-MW-30E | 632.54 |
| House Street | HS-MW-31A | 624.83 |
| House Street | HS-MW-31B | 625.05 |
| House Street | HS-MW-31C | 624.83 |
| House Street | HS-MW-31D | 624.69 |
| House Street | HS-MW-31E | 624.77 |
| House Street | HS-MW-32A | 720.65 |
| House Street | HS-MW-32B | 720.67 |
| House Street | HS-MW-32C | 720.90 |
| House Street | HS-MW-32D | 720.75 |
| House Street | HS-MW-3P | 763.67 |
| House Street | HS-MW-3S | 724.86 |
| House Street | HS-MW-4S | 724.49 |
| House Street | HS-MW-5D | 724.82 |
| House Street | HS-MW-5P | 758.61 |
| House Street | HS-MW-5S | 724.82 |
| House Street | HS-MW-6D | 725.47 |
| House Street | HS-MW-6S | 725.44 |
| House Street | HS-MW-7S | 726.43 |
| House Street | HS-MW-8 | 724.19 |
| House Street | HS-MW-9D | 744.72 |
| House Street | HS-MW-9M | 744.56 |
| House Street | HS-MW-9S | 793.72 |
| North Kent Landfill | NKLF-MW-35 | 867.33 |
| North Kent Landfill | NKLF-MW-48 | 870.29 |
| North Kent Landfill | NKLF-MW-53 | 872.08 |
| North Kent Landfill | NKLF-MW-54 | 877.50 |
| North Kent Landfill | NKLF-MW-55 | 867.98 |
| North Kent Landfill | NKLF-MW-56 | 845.56 |
| North Kent Landfill | NKLF-MW-57 | 862.99 |
| North Kent Landfill | NKLF-MW-60 | 834.09 |
| North Kent Landfill | NKLF-MW-61 | 834.67 |
| North Kent Landfill | NKLF-MW-63 | 752.97 |
| North Kent Landfill | NKLF-MW-65 | 834.86 |
| North Kent Landfill | NKLF-MW-66 | 871.83 |
| North Kent Landfill | NKLF-MW-67 | 863.70 |
| North Kent Landfill | NKLF-MW-68 | 867.15 |
| North Kent Landfill | NKLF-MW-69 | 855.72 |
| North Kent Landfill | NKLF-MW-70 | 848.12 |
| North Kent Landfill | NKLF-MW-71 | 862.76 |
| North Kent Landfill | NKLF-MW-72 | 856.81 |
| North Kent Landfill | NKLF-MW-73 | 895.07 |
| North Kent Landfill | NKLF-MW-74 | 871.50 |
| North Kent Landfill | NKLF-MW-75 | 870.84 |
| North Kent Landfill | NKLF-MW-76 | 848.24 |
| North Kent Landfill | NKLF-MW-77 | 832.26 |
| North Kent Landfill | NKLF-MW-78 | 836.08 |
| North Kent Landfill | NKLF-MW-80 | 867.52 |
| North Kent Landfill | NKLF-MW-81 | 831.74 |
| North Kent Landfill | NKLF-MW-82 | 863.27 |
| North Kent Landfill | NKLF-TW-02 | 863.72 |
| North Kent Landfill | NKLF-TW-04 | 846.15 |
| North Kent Landfill | NKLF-TW-05 | 835.50 |
| North Kent Landfill | NKLF-TW-06 | 854.24 |
| Wolven | WV-DEQ-MW10-121 | 719.14 |
| Wolven | WV-DEQ-MW10-177 | 721.88 |
| Wolven | WV-DEQ-MW10-55 | 723.29 |

**TABLE 2**
STATIC WATER LEVEL MEASUREMENTS
Algoma and Plainfield Townships, Kent County, MI

| Site Location | Well Field ID | November 4, 2019 Static Water Level Elevation (ft) |
|---|---|---|
| Wolven | WV-DEQ-MW10-84 | 720.09 |
| Wolven | WV-DEQ-MW10-95 | 715.81 |
| Wolven | WV-DEQ-MW11-130 | 757.03 |
| Wolven | WV-DEQ-MW11-137 | 757.20 |
| Wolven | WV-DEQ-MW11-145 | 756.95 |
| Wolven | WV-DEQ-MW11-57 | 815.57 |
| Wolven | WV-DEQ-MW11-95 | 810.62 |
| Wolven | WV-DEQ-MW2D | 753.80 |
| Wolven | WV-DEQ-MW2S | 826.21 |
| Wolven | WV-DEQ-MW9-114 | 711.27 |
| Wolven | WV-DEQ-MW9-131 | 711.27 |
| Wolven | WV-DEQ-MW9-57 | 703.29 |
| Wolven | WV-DEQ-MW9-73 | 711.32 |
| Wolven | WV-DEQ-MW9-94 | 711.39 |
| Wolven | WV-MW-1 | 751.30 |
| Wolven | WV-MW-10D | 749.49 |
| Wolven | WV-MW-10M | 747.82 |
| Wolven | WV-MW-10S | 742.24 |
| Wolven | WV-MW-11D | *Artesian Conditions* |
| Wolven | WV-MW-11S | 726.20 |
| Wolven | WV-MW-12D | 716.97 |
| Wolven | WV-MW-12M | 716.94 |
| Wolven | WV-MW-12S | 721.81 |
| Wolven | WV-MW-13D | 803.32 |
| Wolven | WV-MW-13M | 820.92 |
| Wolven | WV-MW-13S | 820.91 |
| Wolven | WV-MW-14D | 731.14 |
| Wolven | WV-MW-14S | 861.25 |
| Wolven | WV-MW-15A | *ND* |
| Wolven | WV-MW-15B | *ND* |
| Wolven | WV-MW-15C | *ND* |
| Wolven | WV-MW-15D | *ND* |
| Wolven | WV-MW-16D | 761.52 |
| Wolven | WV-MW-16S | 815.71 |
| Wolven | WV-MW-2D | 785.38 |
| Wolven | WV-MW-2S | 790.29 |
| Wolven | WV-MW-3D | 802.01 |
| Wolven | WV-MW-3S | 819.14 |
| Wolven | WV-MW-4 | 753.96 |
| Wolven | WV-MW-5D | 802.39 |
| Wolven | WV-MW-5S | 802.11 |
| Wolven | WV-MW-6D | 765.11 |
| Wolven | WV-MW-6S | 781.51 |
| Wolven | WV-MW-7D | 715.73 |
| Wolven | WV-MW-7M | 715.73 |
| Wolven | WV-MW-7S | 715.71 |
| Wolven | WV-MW-8D | 754.38 |
| Wolven | WV-MW-8M | 823.77 |
| Wolven | WV-MW-8S | 823.75 |
| Wolven | WV-MW-9 | 824.90 |
| Rogue River | Dam Seawall | 680.71 |
| Rogue River | E Bridge Street Bridge | 680.34 |
| Rogue River | Rogue River Road Bridge | 618.90 |
| Rogue River | Jericho Ave Bridge | 672.24 |
| Rogue River | USGS04118500 | 630.419 |
| Rogue River | Rogue River at Rum Creek | 692.84 |

**Abbreviations**
*ND* = No data provided/available
ft = feet

**Notes**
1) Elevations are provided in North American Vertical Datum of 1988 (NAVD 88).
2) Water level static measurements were completed on November 4, 2019 by R&W/GZA, AECOM (for EGLE), and North Ke

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-1D | HS-MW-1D | HS-MW-1D | HS-MW-1D | HS-MW-1D | HS-MW-1D | HS-MW-1D | HS-MW-1S | HS-MW-1S | HS-MW-1S | HS-MW-1S | HS-MW-1S | HS-MW-1S | HS-MW-1S | HS-MW-2S | HS-MW-2S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | MW-1D | MW-1D | HS-GW-MW-1D | HS-MW-1D | HS-GW-MW1D | HS-GW-MW1D | HS-GW-MW-1D | MW-1S | MW-1S | HS-GW-MW-1S | HS-MW-1S | HS-GW-MW1S | HS-GW-MW1S | HS-GW-MW-1S | MW-2 | MW-2 |
| Well Screen Interval (Feet below ground surface) | | | 172.3-176.9 | 172.3 - 176.9 | 172.3 - 176.9 | 172.3-176.9 | 172.3-176.9 | 172.3-176.9 | 172.3-176.9 | 67.4-72.1 | 67.4 - 72.1 | 67.4 - 72.1 | 67.4-72.1 | 67.4-72.1 | 67.4-72.1 | 67.4-72.1 | 77.9-82.5 | 77.9 - 82.5 |
| Laboratory Sample ID | | | K1711117-004 | TG26033-001 | TJ24030-014 | UC16019-001 | UE30036-007 | UI28005-011 | UL05055-005 | K1711117-003 | TG26033-002 | TJ24030-013 | UC16019-002 | UE30036-008 | UI28005-010 | UL05055-003 | K1711117-005 | TG26033-003 |
| Sample Date | | | 10/12/2017 | 07/24/2018 | 10/24/2018 | 03/11/2019 | 05/29/2019 | 09/27/2019 | 12/02/2019 | 10/12/2017 | 07/23/2018 | 10/24/2018 | 03/11/2019 | 05/29/2019 | 09/27/2019 | 12/02/2019 | 10/12/2017 | 07/24/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | <0.0042 | - | - | - | - | - | - | <0.0042 | - | - | - | - | - | - | <0.0042 | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0042 | <0.0069 | <0.0073 | <0.0071 | <0.0072 | <0.0068 | <0.0069 | <0.0042 | <0.0074 | <0.0074 | <0.007 | <0.0076 | <0.007 | <0.0071 | <0.0042 | <0.0069 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | <0.0042 | - | - | - | - | - | - | <0.0042 | - | - | - | - | - | - | <0.0042 | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0042 | 0.0046 | 0.0056 | 0.0056 | 0.0057 | 0.005 | 0.0054 | 0.018 | 0.0057 | 0.0059 | 0.0057 | 0.0059 | 0.0051 | 0.0054 | <0.0042 | 0.091 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | - | <0.0069 | <0.0073 | <0.0071 | <0.0072 | <0.0068 | <0.0069 | - | <0.0074 | <0.0074 | <0.007 | <0.0076 | <0.007 | <0.0071 | - | <0.0069 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | - | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | - | 0.0045 | 0.0045 | <0.0035 | 0.0038 | <0.0035 | <0.0035 | - | 0.1 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0042 | 0.0035 | 0.0038 | <0.0035 | <0.0036 | <0.0034 | 0.0035 | 0.026 | 0.039 | 0.043 | 0.04 | 0.034 | 0.026 | 0.022 | <0.0042 | 0.037 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0083 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0083 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0083 | 0.011 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | 0.012 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | 0.011 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | 0.016 | 0.0064 | 0.0061 | 0.0053 | 0.0051 | <0.0035 | <0.0035 | <0.0042 | 0.069 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0017 | 0.0081 | 0.0089 | 0.0091 | 0.0098 | 0.0087 | 0.01 | 0.0042 | 0.0079 [J] | 0.009 [J] | 0.0095 | 0.013 | 0.0064 | 0.0072 | <0.0017 | 0.0048 [J] |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0042 | <0.0034 | <0.0036 | 0.0042 | 0.0044 | 0.0034 | 0.0038 | <0.0042 | <0.0037 | 0.005 [J] | 0.0046 | 0.012 | <0.0035 | 0.006 | <0.0042 | <0.0035 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | 0.0081 | 0.0089 | 0.013 | 0.014 | 0.012 | 0.014 | 0.0042 | 0.0079 | 0.014 | 0.014 | 0.025 | 0.0064 | 0.013 | ND | 0.0048 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | 0.015 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0042 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0042 | <0.0037 | <0.0037 | <0.0035 | <0.0038 | <0.0035 | <0.0035 | <0.0042 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | ND | 0.016 | 0.018 | 0.019 | 0.02 | 0.017 | 0.023 | 0.076 | 0.064 | 0.074 | 0.065 | 0.074 | 0.038 | 0.041 | ND | 0.34 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-2S | HS-MW-2S | HS-MW-2S | HS-MW-2S | HS-MW-2S | HS-MW-3S | HS-MW-3S | HS-MW-3S | HS-MW-3S | HS-MW-3S | HS-MW-3S | HS-MW-3S | HS-MW-3S | HS-MW-3S | HS-MW-3S | HS-MW-4S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW-2S | HS-MW-2 | HS-GW-MW2 | HS-GW-MW2 | HS-GW-MW-2S | MW-3S | MW-3D | MW-3D Dup | HS-GW-MW-3S | HS-GW-MW-3S DUP | HS-MW-3S | HS-MW-3S DUP | HS-GW-MW3S | HS-GW-MW3S | HS-GW-MW-3S | MW-4S |
| Well Screen Interval (Feet below ground surface) | | | 77.9 - 82.5 | 77.9-82.5 | 77.9-82.5 | 77.9-82.5 | 77.9-82.5 | 70.1-75 | 70.1 - 75 | 70.1 - 75 | 70.1 - 75 | 70.1 - 75 | 70.1-75 | 70.1-75 | 70.1-75 | 70.1-75 | 70.1-75 | 70.2-74.8 |
| Laboratory Sample ID | | | TJ24030-012 | UC16019-003 | UE30036-015 | UI28005-012 | UL05055-009 | K1711250-001 | TG26033-005 | TG26033-006 | TJ24030-008 | TJ24030-009 | UC16019-005 | UC16019-006 | UE30036-016 | UI26001-008 | UL05055-011 | K1711250-002 |
| Sample Date | | | 10/24/2018 | 03/11/2019 | 05/30/2019 | 09/27/2019 | 12/03/2019 | 10/13/2017 | 07/24/2018 | 07/24/2018 | 10/23/2018 | 10/23/2018 | 03/13/2019 | 03/13/2019 | 05/30/2019 | 09/24/2019 | 12/03/2019 | 10/13/2017 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | <0.0043 | - | - | - | - | - | - | - | - | - | <0.0043 |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0073 | <0.0071 | <0.0072 | <0.0071 | <0.0075 | <0.0043 | <0.0069 | <0.007 | <0.007 | <0.0069 | <0.007 | <0.007 | <0.0071 | <0.0069 | <0.0071 | <0.0043 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | <0.0043 | - | - | - | - | - | - | - | - | - | <0.0043 |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.14 | 0.079 | 0.099 | 0.089 | 0.04 | 0.37 | 0.28 | 0.29 | 0.32 | 0.33 | 0.38 | 0.39 | 0.5 | 0.4 | 0.57 | 0.093 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | 0.032 | 0.019 | 0.019 | 0.03 | 0.029 | 0.034 | 0.04 | 0.065 | 0.056 | 0.05 | 0.55 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0073 | <0.0071 | <0.0072 | <0.0071 | <0.0075 | - | <0.0069 | <0.007 | <0.007 | <0.0069 | <0.007 | <0.007 | <0.0071 | <0.0069 | <0.0071 | - |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.18 | 0.097 | 0.11 | 0.094 | 0.028 | - | 0.47 | 0.48 | 0.52 | 0.52 | 0.68 | 0.6 | 0.92 | 0.71 | 0.75 | - |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.054 | 0.046 | 0.055 | 0.03 | 0.022 | 0.93 | 1.1 | 1.1 | 1.3 | 1.3 | 1.5 | 1.3 | 2.1 | 1.7 | 1.6 | 1.6 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.019 | 0.0095 | 0.011 | 0.01 | 0.0063 | 0.091 | 0.061 | 0.061 | 0.076 | 0.074 | 0.093 | 0.09 | 0.13 | 0.1 | 0.14 | 0.16 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.037 | 0.023 | 0.022 | 0.018 | 0.0065 | 0.18 | 0.14 | 0.13 | 0.14 | 0.15 | 0.14 | 0.15 | 0.34 | 0.2 | 0.24 | 0.32 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.11 | 0.053 | 0.072 | 0.05 | 0.03 | 0.39 | 0.21 | 0.21 | 0.31 | 0.29 | 0.35 | 0.33 | 0.41 | 0.36 | 0.51 | 0.42 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.0098 [J] | 0.0088 | 0.019 | 0.006 | 0.0044 | 0.38 | 0.52 | 0.52 | 0.59 | 0.61 | 0.69 | 0.63 | 0.89 | 0.83 | 0.73 | 0.83 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | ***0.022*** | ***0.017 [J]*** | ***0.016 [J]*** | ***0.019 [J]*** | ***0.018 [J]*** | ***0.032*** | ***0.032*** | ***0.057*** | ***0.024*** | ***0.023*** | ***2*** |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.0098 | 0.0088 | 0.019 | 0.006 | 0.0044 | 0.4 | 0.54 | 0.54 | 0.61 | 0.63 | 0.72 | 0.66 | 0.95 | 0.85 | 0.75 | 2.8 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.023 | 0.012 | 0.015 | 0.014 | 0.0076 | 0.13 | 0.084 | 0.083 | 0.1 | 0.1 | 0.11 | 0.11 | 0.14 | 0.13 | 0.16 | 0.17 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0037 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0043 |
| Total PFAS (Calculated) | NCL | NCL | 0.57 | 0.33 | 0.4 | 0.31 | 0.14 | 2.5 | 2.9 | 2.9 | 3.4 | 3.4 | 4 | 3.7 | 5.6 | 4.5 | 4.8 | 6.1 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-4S | HS-MW-4S | HS-MW-4S | HS-MW-4S | HS-MW-4S | HS-MW-4S | HS-MW-4S | HS-MW-5D | HS-MW-5D | HS-MW-5D | HS-MW-5D | HS-MW-5D | HS-MW-5D | HS-MW-5D | HS-MW-5D | HS-MW-5S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | MW-4S | MW-4 | HS-GW-MW-4S | HS-MW-4 | HS-GW-MW4 | HS-GW-MW4S | HS-GW-MW-4S | MW-5D | MW-5D | HS-GW-MW-5D | HS-MW-5D | HS-GW-MW5D | HS-GW-MW5D | HS-GW-MW-5D | HS-GW-MW-5D DUP | MW-5S |
| Well Screen Interval (Feet below ground surface) | | | 70.2-74.8 | 70.2 - 74.8 | 70.2 - 74.8 | 70.2-74.8 | 70.2-74.8 | 70.2-74.8 | 70.2-74.8 | 190.5-200.5 | 190.5 - 200.5 | 190.5 - 200.5 | 190.5-200.5 | 190.5-200.5 | 190.5-200.5 | 190.5-200.5 | 190.5-200.5 | 60.3-65 |
| Laboratory Sample ID | | | K1713964-002 | TG26033-014 | TJ24030-006 | UC16019-015 | UE30036-014 | UI26001-009 | UL05055-020 | K1800647-004 | TG26033-009 | TJ24030-003 | UC16019-013 | UE30036-005 | UI26001-007 | UL05055-018 | UL05055-019 | K1711250-003 |
| Sample Date | | | 12/28/2017 | 07/26/2018 | 10/23/2018 | 03/15/2019 | 05/30/2019 | 09/24/2019 | 12/04/2019 | 01/22/2018 | 07/25/2018 | 10/22/2018 | 03/14/2019 | 05/28/2019 | 09/24/2019 | 12/04/2019 | 12/04/2019 | 10/13/2017 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | <0.0042 | - | - | - | - | - | - | <0.0042 | - | - | - | - | - | - | - | <0.0042 |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0042 | <0.007 | <0.007 | <0.007 | <0.0069 | <0.007 | <0.0074 | <0.0042 | <0.0075 | <0.0071 | <0.0071 | <0.0069 | <0.0073 | <0.007 | <0.0072 | <0.0042 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | <0.0042 | - | - | - | - | - | - | <0.0042 | - | - | - | - | - | - | - | <0.0042 |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.17 | 0.16 | 0.097 | 0.058 | 0.055 | 0.033 | 0.1 | 0.0054 | 0.0063 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | 0.005 | 0.0068 | 0.57 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | 0.95 | 0.84 | 0.61 | 0.56 | 0.46 | 0.27 | 0.74 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | 1.1 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | - | <0.007 | <0.007 | <0.007 | <0.0069 | <0.007 | <0.0074 | - | <0.0075 | <0.0071 | <0.0071 | <0.0069 | <0.0073 | <0.007 | <0.0072 | - |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | - | 0.56 | 0.31 | 0.18 | 0.19 | 0.14 | 0.38 | - | 0.0072 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | 0.0053 | 0.0077 | - |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 3.2 | 6 | 3.5 | 3 | 2.9 | 2.1 | 4.6 | 0.013 | 0.017 | 0.004 | <0.0035 | <0.0034 | 0.0058 | 0.013 | 0.02 | 1.9 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.29 | 0.29 | 0.16 | 0.095 | 0.071 | 0.047 | 0.23 | <0.0083 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | 0.14 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.56 | 0.4 | 0.3 | 0.19 | 0.19 | 0.15 | 0.45 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | 0.71 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.73 | 0.55 | 0.42 | 0.22 | 0.2 | 0.12 | 0.48 | 0.0077 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | 0.45 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | 0.006 | 0.0051 | 0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | 0.018 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 1.5 | 2.7 | 1.6 | 1.5 | 1.4 | 0.82 | 2.1 | 0.0089 | 0.0091 | 0.002 | <0.0018 | 0.0028 | 0.0035 | 0.008 | 0.013 | 2.8 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***3.6*** | ***5.9 [J]*** | ***4.8 [J]*** | ***4.5*** | ***3.2*** | ***1.1*** | ***2.3*** | ***0.026*** | ***0.021 [J]*** | 0.0056 [J] | 0.0053 | 0.011 | 0.0083 | 0.01 | ***0.015*** | ***44*** |
| PFOA + PFOS (Calculated) | NCL | NCL | 5.1 | 8.6 | 6.4 | 6 | 4.6 | 1.9 | 4.4 | 0.035 | 0.03 | 0.0076 | 0.0053 | 0.014 | 0.012 | 0.018 | 0.028 | 47 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.33 | 0.27 | 0.16 | 0.094 | 0.075 | 0.048 | 0.21 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | 0.19 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0042 | <0.0037 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0042 |
| Total PFAS (Calculated) | NCL | NCL | 11 | 18 | 12 | 10 | 8.7 | 4.8 | 12 | 0.061 | 0.061 | 0.012 | 0.0053 | 0.014 | 0.018 | 0.041 | 0.063 | 52 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-5S | HS-MW-5S | HS-MW-5S | HS-MW-5S | HS-MW-5S | HS-MW-5S | HS-MW-5S | HS-MW-6D | HS-MW-6D | HS-MW-6D | HS-MW-6D | HS-MW-6D | HS-MW-6D | HS-MW-6D | HS-MW-6S | HS-MW-6S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | MW-5S | MW-5M | HS-GW-MW-5M | HS-MW-5S | HS-GW-MW5S | HS-GW-MW5S | HS-GW-MW-5S | MW-6D | MW-6D | HS-GW-MW-6D | HS-MW-6D | HS-GW-MW6D | HS-GW-MW6D | HS-GW-MW-6D | MW-6S | MW-6S |
| Well Screen Interval (Feet below ground surface) | | | 60.3-65 | 60.3 - 65 | 60.3 - 65 | 60.3-65 | 60.3-65 | 60.3-65 | 60.3-65 | 157.5-162.5 | 157.5 - 162.5 | 157.5 - 162.5 | 157.5-162.5 | 157.5-162.5 | 157.5-162.5 | 157.5-162.5 | 58.2-62.9 | 58.2 - 62.9 |
| Laboratory Sample ID | | | K1713964-001 | TG26033-008 | TJ24030-004 | UC16019-012 | UE30036-004 | UI26001-006 | UL05055-021 | K1713273-007 | TG26033-015 | TJ24030-002 | UC21029-008 | UE30036-009 | UI28005-004 | UL05055-028 | K1711250-004 | TG26033-016 |
| Sample Date | | | 12/28/2017 | 07/25/2018 | 10/23/2018 | 03/14/2019 | 05/28/2019 | 09/24/2019 | 12/04/2019 | 12/07/2017 | 07/26/2018 | 10/22/2018 | 03/20/2019 | 05/29/2019 | 09/26/2019 | 12/05/2019 | 10/16/2017 | 07/26/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | <0.03 | - | - | - | - | - | - | <0.0043 | - | - | - | - | - | - | <0.0042 | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.03 | <0.37 | <0.14 | <0.16 | <0.14 | <0.14 | <0.14 | <0.0043 | <0.007 | <0.0069 | <0.007 | <0.0071 | <0.0072 | <0.0071 | <0.0042 | <0.0069 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | <0.03 | - | - | - | - | - | - | <0.0043 | - | - | - | - | - | - | <0.0042 | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 1.6 | 1.2 | 1.1 | 1.9 | 1.6 | 1.4 | 1.4 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | 0.0051 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | 2.2 | 2.2 | 1.4 | 1.7 | 3.5 | 2.2 | 3.4 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | - | <0.37 | <0.14 | <0.16 | <0.14 | <0.14 | <0.14 | - | <0.007 | <0.0069 | <0.007 | <0.0071 | <0.0072 | <0.0071 | - | <0.0069 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 [UJ] |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | - | 1.8 | 1.7 | 3.1 | 3.1 | 2.8 | 3.5 | - | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | - | 0.01 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 8.2 | 5.6 | 4.7 | 7.5 | 11 | 9.9 | 15 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | 0.014 | 0.048 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.36 | 0.29 | 0.28 | 0.56 | 0.52 | 0.47 | 0.43 | <0.0086 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0083 | <0.0035 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 1.9 | 0.99 | 0.84 | 1.6 | 1.8 | 1.4 | 2.4 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | 0.0061 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 1.3 | 0.81 | 0.74 | 1.5 | 1.6 | 1.3 | 1.3 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | 0.0065 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | 0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 7.4 | 6.2 | 5.6 | ***8.5*** | ***11*** | ***8.2*** | ***11*** | <0.0017 | <0.0018 | <0.0017 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | 0.0098 | 0.028 [J] |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***41*** | ***81 [J]*** | ***47 [J]*** | ***42*** | ***100*** | ***59*** | ***71*** | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| PFOA + PFOS (Calculated) | NCL | NCL | 48 | 87 | 53 | 51 | 110 | 67 | 82 | ND | ND | ND | ND | ND | ND | ND | 0.0098 | 0.028 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.51 | 0.36 | 0.37 | 0.65 | 0.61 | 0.54 | 0.51 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 [UJ] |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.03 | <0.19 | <0.07 | <0.078 | <0.07 | <0.07 | <0.071 | <0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0042 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | 65 | 100 | 64 | 69 | 130 | 87 | 110 | ND | ND | ND | ND | ND | ND | ND | 0.024 | 0.1 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-6S | HS-MW-6S | HS-MW-6S | HS-MW-6S | HS-MW-6S | HS-MW-7S | HS-MW-7S | HS-MW-7S | HS-MW-7S | HS-MW-7S | HS-MW-7S | HS-MW-7S | HS-MW-7S | HS-MW-8 | HS-MW-8 | HS-MW-8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW-6S | HS-MW-6S | HS-GW-MW6S | HS-GW-MW6S | HS-GW-MW-6S | MW-7S | MW-7 | HS-GW-MW-7S | HS-MW-7S | HS-MW-7S DUP | HS-GW-MW7S | HS-GW-MW7S | HS-GW-MW-7S | MW-8 | MW-8 | HS-GW-MW-8 |
| Well Screen Interval (Feet below ground surface) | | | 58.2 - 62.9 | 58.2-62.9 | 58.2-62.9 | 58.2-62.9 | 58.2-62.9 | 69.9-74.5 | 69.9 - 74.5 | 69.9 - 74.5 | 69.9-74.5 | 69.9-74.5 | 69.9-74.5 | 69.9-74.5 | 69.9-74.5 | 30-35 | 30 - 35 | 30 - 35 |
| Laboratory Sample ID | | | TJ24030-001 | UC21029-007 | UE30036-010 | UI28005-005 | UL05055-027 | K1711250-005 | TG28011-001 | TJ24030-007 | UC23028-001 | UC23028-002 | UE30036-017 | UI26001-004 | UL05055-022 | K1713273-008 | TG28011-002 | TJ24030-015 |
| Sample Date | | | 10/22/2018 | 03/20/2019 | 05/29/2019 | 09/26/2019 | 12/05/2019 | 10/16/2017 | 07/27/2018 | 10/23/2018 | 03/21/2019 | 03/21/2019 | 05/30/2019 | 09/23/2019 | 12/04/2019 | 12/07/2017 | 07/27/2018 | 10/24/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | <0.0042 | - | - | - | - | - | - | - | <0.0044 | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0069 | <0.0073 | <0.0069 | <0.0072 | <0.0072 | <0.0042 | <0.007 | <0.007 | <0.0071 | <0.007 | <0.0069 | <0.0067 | <0.007 | <0.0044 | <0.0071 | <0.0074 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | <0.0042 | - | - | - | - | - | - | - | <0.0044 | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.039 | 0.047 | 0.0052 | 0.034 | 0.0046 | <0.0042 | 0.0046 | 0.0058 | 0.0051 | 0.0053 | 0.006 | 0.0046 | 0.0055 | 0.11 | 0.1 | 0.041 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | 0.12 | 0.032 | 0.16 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0069 | <0.0073 | <0.0069 | <0.0072 | <0.0072 | - | <0.007 | <0.007 | <0.0071 | <0.007 | <0.0069 | <0.0067 | <0.007 | - | <0.0071 | <0.0074 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.058 | 0.061 | 0.011 | 0.036 | <0.0036 | - | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | - | 0.12 | 0.053 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.08 | 0.085 | 0.039 | 0.074 | 0.013 | 0.0069 | 0.0064 | 0.0093 | 0.011 | 0.0099 | 0.0089 | 0.0089 | 0.01 | 0.25 | 0.28 | 0.22 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0035 | 0.0046 | <0.0035 | 0.0036 | <0.0036 | <0.0083 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | 0.018 | 0.017 | 0.011 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.013 | 0.015 | 0.0043 | 0.012 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | 0.088 | 0.079 | 0.046 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.029 | 0.031 | 0.0053 | 0.021 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | 0.033 | 0.049 | 0.023 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.045 [J] | 0.044 | 0.028 | 0.043 | 0.012 | 0.0033 | 0.0023 [J] | 0.0024 [J] | 0.0029 | 0.003 | 0.0035 | 0.0029 | 0.003 | 0.6 | 0.62 | 0.59 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | 0.0049 [J] | 0.0087 | 0.0059 | 0.005 | 0.0046 | 0.0047 | 0.0035 [J] | 0.004 [J] | <0.0035 | <0.0035 | 0.0037 | 0.0047 | 0.0091 | ***0.15*** | ***0.045 [J]*** | ***0.18 [J]*** |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.05 | 0.053 | 0.034 | 0.048 | 0.017 | 0.008 | 0.0058 | 0.0064 | 0.0029 | 0.003 | 0.0072 | 0.0076 | 0.012 | 0.75 | 0.67 | 0.77 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.0061 | 0.0078 | <0.0035 | 0.006 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | 0.017 | 0.016 | 0.0091 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0035 | <0.0044 | <0.0035 | <0.0037 |
| Total PFAS (Calculated) | NCL | NCL | 0.28 | 0.3 | 0.099 | 0.23 | 0.034 | 0.015 | 0.017 | 0.022 | 0.019 | 0.018 | 0.022 | 0.021 | 0.028 | 1.4 | 1.4 | 1.3 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-8 | HS-MW-8 | HS-MW-8 | HS-MW-8 | HS-MW-9D | HS-MW-9D | HS-MW-9D | HS-MW-9D | HS-MW-9D | HS-MW-9D | HS-MW-9D | HS-MW-9D | HS-MW-9M | HS-MW-9M | HS-MW-9M | HS-MW-9M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-MW-8 | HS-GW-MW8 | HS-GW-MW8 | HS-GW-MW-8 | MW-9C | MW-9D | HS-GW-MW-9D | HS-MW-9D | HS-GW-MW9D | HS-GW-MW9D DUP | HS-GW-MW9D | HS-GW-MW-9D | MW-9B | MW-9M | HS-GW-MW-9M | HS-MW-9M |
| Well Screen Interval (Feet below ground surface) | | | 30-35 | 30-35 | 30-35 | 30-35 | 204.3-209.3 | 204.3 - 209.3 | 204.3 - 209.3 | 204.3-209.3 | 204.3-209.3 | 204.3-209.3 | 204.3-209.3 | 204.3-209.3 | 126.8-131.8 | 126.8 - 131.8 | 126.8 - 131.8 | 126.8-131.8 |
| Laboratory Sample ID | | | UC23028-003 | UE30036-006 | UI26001-010 | UL05055-031 | K1713273-004 | TH01022-002 | TJ24030-022 | UC21029-006 | UE24001-014 | UE24001-015 | UI26001-014 | UL12091-004 | K1713273-002 | TH01022-005 | TJ24030-017 | UC21029-005 |
| Sample Date | | | 03/21/2019 | 05/29/2019 | 09/24/2019 | 12/06/2019 | 12/06/2017 | 07/31/2018 | 10/25/2018 | 03/19/2019 | 05/22/2019 | 05/22/2019 | 09/25/2019 | 12/09/2019 | 12/06/2017 | 07/30/2018 | 10/25/2018 | 03/19/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | <0.0041 | - | - | - | - | - | - | - | <0.0043 | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0072 | <0.0071 | <0.0078 | <0.0075 | <0.0041 | <0.007 | <0.0073 | <0.007 | <0.0072 | <0.0071 | <0.0068 | <0.0076 | <0.0043 | <0.0069 | <0.0069 | <0.0071 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | <0.0041 | - | - | - | - | - | - | - | <0.0043 | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.026 | 0.028 | 0.075 | 0.086 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | 0.078 | 0.033 | 0.09 | 0.12 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0072 | <0.0071 | <0.0078 | <0.0075 | - | <0.007 | <0.0073 | <0.007 | <0.0072 | <0.0071 | <0.0068 | <0.0076 | - | <0.0069 | <0.0069 | <0.0071 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | 0.0064 | <0.0034 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.044 | 0.035 | 0.13 | 0.11 | - | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | - | <0.0035 | <0.0034 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.15 | 0.085 | 0.39 | 0.32 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.0066 | 0.0066 | 0.012 | 0.017 | <0.0081 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0086 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.037 | 0.044 | 0.06 | 0.074 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.016 | 0.024 | 0.028 | 0.031 | 0.0064 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.38 | 0.35 | 1.3 | 0.7 | <0.0016 | <0.0017 | <0.0018 | <0.0017 | <0.0018 | <0.0018 | <0.0017 | <0.0019 | <0.0017 | <0.0017 | <0.0017 | <0.0018 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.14*** | ***0.051*** | ***0.099*** | ***0.12*** | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.52 | 0.4 | 1.4 | 0.82 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.0055 | 0.0067 | 0.01 | 0.011 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0039 | <0.0038 | <0.0041 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0038 | <0.0043 | <0.0035 | <0.0034 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.88 | 0.66 | 2.2 | 1.6 | 0.0064 | ND | ND | ND | ND | ND | ND | ND | ND | 0.0064 | ND | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-9M | HS-MW-9M | HS-MW-9M | HS-MW-9S | HS-MW-9S | HS-MW-9S | HS-MW-9S | HS-MW-9S | HS-MW-9S | HS-MW-9S | HS-MW-9S | HS-MW-9S | HS-MW-10D | HS-MW-10D | HS-MW-10D | HS-MW-10D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW9M | HS-GW-MW9M | HS-GW-MW-9M | MW-9A | MW-9S | HS-GW-MW-9S | HS-GW-MW-9S | HS-MW-9S | HS-GW-MW9S | HS-GW-MW9S | HS-GW-MW-9S | HS-GW-MW-9S DUP | MW-10C | MW-10D | HS-GW-MW-10D | HS-MW-10D |
| Well Screen Interval (Feet below ground surface) | | | 126.8-131.8 | 126.8-131.8 | 126.8-131.8 | 26.2-31.2 | 26.2 - 31.2 | 26.2 - 31.2 | 26.2 - 31.2 | 26.2-31.2 | 26.2-31.2 | 26.2-31.2 | 26.2-31.2 | 26.2-31.2 | 188.2-193.2 | 188.2 - 193.2 | 188.2 - 193.2 | 188.2-193.2 |
| Laboratory Sample ID | | | UE24001-013 | UI26001-020 | UL12091-003 | K1713273-001 | TH01022-004 | TJ24030-016 | TK12032-001 | UC21029-004 | UE24001-012 | UI26001-016 | UL12091-013 | UL12091-014 | K1800647-002 | TH01022-007 | TJ24030-021 | UC21029-003 |
| Sample Date | | | 05/22/2019 | 09/25/2019 | 12/09/2019 | 12/06/2017 | 07/30/2018 | 10/24/2018 | 11/07/2018 | 03/19/2019 | 05/22/2019 | 09/25/2019 | 12/11/2019 | 12/11/2019 | 01/22/2018 | 08/01/2018 | 10/25/2018 | 03/18/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0064 | <0.0035 | <0.0034 | <0.0037 [UJ] | <0.0036 | <0.0035 | 0.0039 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | <0.0042 | - | - | - | - | - | - | - | - | <0.0044 | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0069 | <0.0071 | <0.0071 | <0.0042 | <0.007 | <0.0069 | <0.0073 | <0.0073 | <0.007 | <0.0074 | <0.0077 | <0.0074 | <0.0044 | <0.0069 | <0.0069 | <0.0075 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | <0.0042 | - | - | - | - | - | - | - | - | <0.0044 | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | 0.005 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0069 | <0.0071 | <0.0071 | - | <0.007 | <0.0069 | <0.0073 | <0.0073 | <0.007 | <0.0074 | <0.0077 | <0.0074 | - | <0.0069 | <0.0069 | <0.0075 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | - | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | - | <0.0034 | <0.0035 | <0.0038 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0083 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | 0.0049 | 0.0049 | <0.0088 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0017 | <0.0018 | <0.0018 | 0.0024 | <0.0017 | <0.0017 | <0.0018 | <0.0018 | <0.0017 | <0.0018 | 0.0048 | 0.0049 | <0.0018 | <0.0017 | <0.0017 | <0.0019 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | 0.0055 [J] | <0.0037 | <0.0036 | 0.0049 | <0.0037 | 0.0076 | 0.0081 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | 0.0024 | ND | 0.0055 | ND | ND | 0.0049 | ND | 0.012 | 0.013 | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0036 | <0.0042 | <0.0035 | <0.0034 | <0.0037 | <0.0036 | <0.0035 | <0.0037 | <0.0038 | <0.0037 | <0.0044 | <0.0034 | <0.0035 | <0.0038 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | 0.0074 | ND | 0.0055 | ND | ND | 0.0049 | 0.0039 | 0.017 | 0.018 | ND | ND | ND | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-10D | HS-MW-10D | HS-MW-10D | HS-MW-10M | HS-MW-10M | HS-MW-10M | HS-MW-10M | HS-MW-10M | HS-MW-10M | HS-MW-10M | HS-MW-10M | HS-MW-10S | HS-MW-10S | HS-MW-10S | HS-MW-10S | HS-MW-10S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW10D | HS-GW-MW10D | HS-GW-MW-10D | MW-10B | MW-10M | HS-GW-MW-10M | HS-MW-10M | HS-GW-MW10M | HS-GW-MW10M | HS-GW-MW10M DUP | HS-GW-MW-10M | MW-10A | MW-10S | HS-GW-MW-10S | HS-MW-10S | HS-GW-MW10S |
| Well Screen Interval (Feet below ground surface) | | | 188.2-193.2 | 188.2-193.2 | 188.2-193.2 | 126.4-131.4 | 126.4 - 131.4 | 126.4 - 131.4 | 126.4-131.4 | 126.4-131.4 | 126.4-131.4 | 126.4-131.4 | 126.4-131.4 | 48.3-58.3 | 48.3 - 58.3 | 48.3 - 58.3 | 48.3-58.3 | 48.3-58.3 |
| Laboratory Sample ID | | | UE24001-003 | UI26001-015 | UL05055-006 | K1800647-001 | TH01022-008 | TJ24030-018 | UC21029-002 | UE24001-002 | UI26001-017 | UI26001-018 | UL05055-010 | K1800647-003 | TH01022-003 | TJ27021-002 | UC21029-001 | UE24001-001 |
| Sample Date | | | 05/20/2019 | 09/25/2019 | 12/02/2019 | 01/22/2018 | 08/01/2018 | 10/25/2018 | 03/18/2019 | 05/20/2019 | 09/25/2019 | 09/25/2019 | 12/03/2019 | 01/22/2018 | 07/31/2018 | 10/26/2018 | 03/18/2019 | 05/20/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | <0.0042 | - | - | - | - | - | - | - | <0.0042 | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.007 | <0.0072 | <0.007 | <0.0042 | <0.0077 | <0.007 | <0.007 | <0.007 | <0.0072 | <0.0071 | <0.0071 | <0.0042 | <0.007 | <0.007 | <0.007 | <0.0078 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | <0.0042 | - | - | - | - | - | - | - | <0.0042 | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | 0.0084 | 0.0062 | 0.01 | 0.0085 | 0.0063 | 0.0075 | 0.0079 | 0.0089 | <0.0042 | 0.004 | 0.0036 | <0.0035 | 0.004 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | 0.0085 | 0.0055 | 0.0051 | 0.0047 | 0.0049 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.007 | <0.0072 | <0.007 | - | <0.0077 | <0.007 | <0.007 | <0.007 | <0.0072 | <0.0071 | <0.0071 | - | <0.007 | <0.007 | <0.007 | <0.0078 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | - | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | - | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | 0.0045 | 0.0052 | 0.0054 | 0.0048 | 0.0036 | 0.0039 | 0.0039 | 0.0039 | 0.008 | 0.01 | 0.0075 | 0.006 | 0.0084 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0083 | <0.0039 | 0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0083 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0017 | <0.0018 | <0.0018 | 0.0093 | 0.0073 | 0.0092 | 0.0084 | 0.0072 | 0.0096 | 0.0094 | 0.01 | 0.015 | 0.014 | 0.015 | 0.012 | 0.015 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0035 | <0.0036 | <0.0035 | 0.012 | 0.012 | ***0.014*** | ***0.013*** | 0.012 | 0.012 | 0.011 | ***0.013*** | ***0.037*** | ***0.041 [J]*** | ***0.041 [J]*** | ***0.04*** | ***0.036*** |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | 0.021 | 0.019 | 0.023 | 0.021 | 0.019 | 0.022 | 0.02 | 0.023 | 0.052 | 0.055 | 0.056 | 0.052 | 0.051 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0042 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0042 | <0.0035 | <0.0035 | <0.0035 | <0.0039 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | 0.034 | 0.031 | 0.042 | 0.035 | 0.029 | 0.033 | 0.032 | 0.036 | 0.069 | 0.075 | 0.072 | 0.063 | 0.068 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-10S | HS-MW-10S | HS-MW-11D | HS-MW-11D | HS-MW-11D | HS-MW-11D | HS-MW-11D | HS-MW-11D | HS-MW-11D | HS-MW-11M | HS-MW-11M | HS-MW-11M | HS-MW-11M | HS-MW-11M | HS-MW-11M | HS-MW-11M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW10S | HS-GW-MW-10S | MW-11C | MW-11D | HS-GW-MW-11D | HS-MW-11D | HS-GW-MW11D | HS-GW-MW11D | HS-GW-MW-11D | MW-11B | MW-11M | HS-GW-MW-11M | HS-MW-11M | HS-GW-MW11M | HS-GW-MW11M | HS-GW-MW-11M |
| Well Screen Interval (Feet below ground surface) | | | 48.3-58.3 | 48.3-58.3 | 153.6-158.6 | 153.6 - 158.6 | 153.6 - 158.6 | 153.6-158.6 | 153.6-158.6 | 153.6-158.6 | 153.6-158.6 | 96.4-101.4 | 96.4 - 101.4 | 96.4 - 101.4 | 96.4-101.4 | 96.4-101.4 | 96.4-101.4 | 96.4-101.4 |
| Laboratory Sample ID | | | UI26001-019 | UL05055-001 | K1713273-012 | TH01022-016 | TJ27021-001 | UC16019-011 | UE24001-016 | UI28005-003 | UL05055-013 | K1713273-015 | TH01022-017 | TJ27021-003 | UC16019-010 | UE24001-018 | UI28005-002 | UL05055-012 |
| Sample Date | | | 09/25/2019 | 12/02/2019 | 12/08/2017 | 08/02/2018 | 10/26/2018 | 03/14/2019 | 05/22/2019 | 09/26/2019 | 12/03/2019 | 12/08/2017 | 08/02/2018 | 10/26/2018 | 03/14/2019 | 05/22/2019 | 09/26/2019 | 12/03/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0077 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0081 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | <0.0041 | - | - | - | - | - | - | <0.0041 | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0072 | <0.0071 | <0.0041 | <0.0071 | <0.007 | <0.0076 | <0.0075 | <0.0073 | <0.0075 | <0.0041 | <0.0069 | <0.0072 | <0.0072 | <0.0072 | <0.0074 | <0.0073 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | <0.0041 | - | - | - | - | - | - | <0.0041 | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0036 | 0.0037 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | 0.0061 | 0.014 | 0.013 | 0.046 | 0.05 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | 0.0037 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0072 | <0.0071 | - | <0.0071 | <0.007 | <0.0076 | <0.0075 | <0.0073 | <0.0075 | - | <0.0069 | <0.0072 | <0.0072 | <0.0072 | <0.0074 | <0.0073 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | 0.014 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | <0.0035 | - | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | - | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | 0.016 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.014 | 0.013 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | 0.0045 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | <0.0035 | <0.0081 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0081 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.018 | 0.021 | <0.0016 | <0.0018 | <0.0018 | <0.0019 | <0.0019 | <0.0018 | <0.0019 | <0.0016 | <0.0017 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0018 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.024*** | ***0.024*** | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.042 | 0.045 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0041 | <0.0036 | <0.0035 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0041 | <0.0034 | <0.0036 | <0.0036 | <0.0036 | <0.0037 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.056 | 0.065 | ND | 0.014 | ND | ND | ND | ND | ND | ND | ND | 0.0061 | 0.014 | 0.013 | 0.046 | 0.071 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-11S | HS-MW-11S | HS-MW-11S | HS-MW-11S | HS-MW-11S | HS-MW-11S | HS-MW-11S | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | MW-11A | MW-11S | HS-GW-MW-11S | HS-MW-11S | HS-GW-MW11S | HS-GW-MW11S | HS-GW-MW-11S | HS-MW-12 (15-20) | HS-MW-12 (25-30) | HS-MW-12 (35-40) | HS-MW-12 (49-54) | HS-MW-12 (75-80) | HS-MW-12 (85-90) | HS-MW-12 (95-100) | HS-MW-12 (105-110) | HS-MW-12 (115-120) |
| Well Screen Interval (Feet below ground surface) | | | 21.2-31.2 | 21.2 - 31.2 | 21.2 - 31.2 | 21.2-31.2 | 21.2-31.2 | 21.2-31.2 | 21.2-31.2 | 15-20 | 25-30 | 35-40 | 49-54 | 75-80 | 85-90 | 95-100 | 105-110 | 115-120 |
| Laboratory Sample ID | | | K1713273-011 | TH01022-018 | TJ27021-005 | UC16019-009 | UE24001-017 | UI28005-001 | UL05055-014 | UI05015-001 | UI05015-002 | UI05015-003 | UI12066-001 | UI12066-002 | UI12066-003 | UI12066-004 | UI12066-005 | UI12066-006 |
| Sample Date | | | 12/08/2017 | 08/02/2018 | 10/26/2018 | 03/14/2019 | 05/22/2019 | 09/26/2019 | 12/03/2019 | 09/04/2019 | 09/04/2019 | 09/04/2019 | 09/06/2019 | 09/10/2019 | 09/10/2019 | 09/11/2019 | 09/11/2019 | 09/11/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | <0.0043 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0043 | <0.0074 | <0.007 | <0.0072 | <0.0075 | <0.0077 | <0.0071 | <0.0071 | <0.0078 | <0.0075 | <0.0075 | <0.0076 | <0.007 | <0.0074 | <0.0072 | <0.0078 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | <0.0043 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | 0.034 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | 0.0083 | 0.054 | 0.035 | 0.06 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | - | <0.0074 | <0.007 | <0.0072 | <0.0075 | <0.0077 | <0.0071 | <0.0071 | <0.0078 | <0.0075 | <0.0075 | <0.0076 | <0.007 | <0.0074 | <0.0072 | <0.0078 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | - | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | 0.029 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | 0.0065 | 0.052 | 0.022 | 0.055 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | 0.038 | 0.0067 | 0.0052 | 0.0038 | <0.0038 | 0.0062 | 0.069 | 0.015 | 0.064 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0086 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | 0.0071 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | 0.013 | 0.012 | 0.018 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | 0.012 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | 0.0035 | 0.027 | 0.018 | 0.035 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | 0.013 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | 0.0044 | 0.028 | 0.02 | 0.034 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0017 | <0.0019 | 0.0018 | 0.0024 | 0.0028 | <0.0019 | 0.0041 | 0.026 | 0.0065 | <0.0019 | <0.0019 | <0.0019 | 0.0093 | 0.086 | 0.033 | 0.1 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | 0.0046 | <0.0036 | <0.0039 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | 0.0018 | 0.0024 | 0.0028 | ND | 0.0041 | 0.026 | 0.0065 | ND | ND | ND | 0.0093 | 0.091 | 0.033 | 0.1 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | 0.0064 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | 0.012 | 0.011 | 0.017 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0043 | <0.0037 | <0.0035 | <0.0036 | <0.0038 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0037 | <0.0038 | <0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0039 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | 0.0018 | 0.0024 | 0.0028 | ND | 0.0041 | 0.17 | 0.013 | 0.0052 | 0.0038 | ND | 0.038 | 0.35 | 0.17 | 0.38 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-PMW-12 | HS-MW-12A | HS-MW-12B | HS-MW-12C | HS-MW-12D | HS-MW-12E | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-MW-12 (125-130) | HS-MW-12 (135-140) | HS-MW-12 (145-150) | HS-MW-12 (155-160) | HS-MW-12 (165-170) | HS-MW-12 (175-180) | HS-MW-12 (185-190) | HS-GW-MW-12A | HS-GW-MW-12B | HS-GW-MW-12C | HS-GW-MW-12D | HS-GW-MW-12E | HS-13 59-64 | HS-13 69-74 | HS-13 79-84 | HS-13 89-94 |
| Well Screen Interval (Feet below ground surface) | | | 125-130 | 135-140 | 145-150 | 155-160 | 165-170 | 175-180 | 185-190 | 15.4-20.4 | 51.5-56.5 | 127.7-132.7 | 158.7-163.7 | 187.5-192.5 | 59-64 | 69-74 | 79-84 | 89-94 |
| Laboratory Sample ID | | | UI12066-007 | UI18051-001 | UI18051-002 | UI18051-003 | UI18051-004 | UI18051-005 | UI18051-006 | UK29008-021 | UK29008-012 | UK29008-011 | UK29008-010 | UK29008-013 | UL12092-001 | UL12092-002 | UL12092-003 | UL12092-004 |
| Sample Date | | | 09/11/2019 | 09/12/2019 | 09/12/2019 | 09/12/2019 | 09/13/2019 | 09/13/2019 | 09/16/2019 | 11/27/2019 | 11/25/2019 | 11/25/2019 | 11/25/2019 | 11/25/2019 | 12/09/2019 | 12/10/2019 | 12/10/2019 | 12/10/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0068 | <0.0079 | <0.0072 | <0.0074 | <0.0074 | <0.0074 | <0.0069 | <0.0072 | <0.0073 | <0.0076 | <0.0068 | <0.007 | <0.0068 | <0.0068 | <0.0068 | <0.0068 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.095 | 0.079 | 0.11 | 0.17 | 0.13 | 0.061 | <0.0035 | <0.0036 | <0.0037 | 0.13 | 0.14 | <0.0035 | 0.0044 | 0.0044 | 0.0054 | 0.0051 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0068 | <0.0079 | <0.0072 | <0.0074 | <0.0074 | <0.0074 | <0.0069 | <0.0072 | <0.0073 | <0.0076 | <0.0068 | <0.007 | <0.0068 | <0.0068 | <0.0068 | <0.0068 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.09 | 0.085 | 0.11 | 0.13 | 0.11 | 0.037 | <0.0035 | <0.0036 | <0.0037 | 0.13 | 0.12 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.09 | 0.082 | 0.1 | 0.06 | 0.06 | 0.013 | <0.0035 | <0.0036 | 0.0054 | 0.12 | 0.091 | <0.0035 | <0.0034 | <0.0034 | 0.011 | 0.0079 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.029 | 0.021 | 0.026 | 0.054 | 0.037 | 0.023 | <0.0035 | <0.0036 | <0.0037 | 0.036 | 0.037 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.056 | 0.045 | 0.057 | 0.078 | 0.065 | 0.025 | <0.0035 | <0.0036 | <0.0037 | 0.07 | 0.072 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.056 | 0.045 | 0.061 | 0.1 | 0.074 | 0.037 | <0.0035 | <0.0036 | <0.0037 | 0.076 | 0.09 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.15 | 0.13 | 0.15 | 0.14 | 0.13 | 0.037 | <0.0017 | 0.0089 | 0.0023 | 0.19 | 0.17 | <0.0017 | <0.0017 | <0.0017 | 0.0018 | 0.0035 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | 0.0063 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.15 | 0.13 | 0.15 | 0.14 | 0.13 | 0.037 | ND | 0.015 | 0.0023 | 0.19 | 0.17 | ND | ND | ND | 0.0018 | 0.0035 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.028 | 0.023 | 0.029 | 0.059 | 0.036 | 0.023 | <0.0035 | 0.0039 | <0.0037 | 0.039 | 0.038 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0034 | <0.0039 | <0.0036 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0037 | <0.0038 | <0.0034 | <0.0035 | <0.0034 | <0.0034 | <0.0034 | <0.0034 |
| Total PFAS (Calculated) | NCL | NCL | 0.59 | 0.51 | 0.64 | 0.79 | 0.64 | 0.26 | ND | 0.019 | 0.0077 | 0.79 | 0.76 | ND | 0.0044 | 0.0044 | 0.018 | 0.017 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-13 | HS-PMW-14 | HS-PMW-14 | HS-PMW-14 | HS-PMW-14 | HS-PMW-14 | HS-PMW-14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-13 99-104 | HS-13 109-114 | HS-13 119-124 | HS-13 129-134 | HS-13-139-144 | HS-13-149-154 | HS-13-159-164 | HS-13-169-174 | HS-13-179-184 | HS-13 189-194 | PMW-14 18-23 | PMW-14 38-43 | PMW-14 48-53 | PMW-14 63-68 | PMW-14 73-78 | PMW-14 83-88 |
| Well Screen Interval (Feet below ground surface) | | | 99-104 | 109-114 | 119-124 | 129-134 | 139-144 | 149-154 | 159-164 | 169-174 | 179-184 | 189-194 | 18-23 | 38-43 | 48-53 | 63-68 | 73-78 | 83-88 |
| Laboratory Sample ID | | | UL12092-005 | UL12092-006 | UL12092-007 | UL12092-008 | UL17018-001 | UL17018-002 | UL17018-003 | UL17018-004 | UL17018-005 | UL19173-001 | K1802201-001 | K1802201-002 | K1802201-003 | K1802247-001 | K1802247-002 | K1802247-005 |
| Sample Date | | | 12/10/2019 | 12/11/2019 | 12/11/2019 | 12/11/2019 | 12/12/2019 | 12/12/2019 | 12/12/2019 | 12/13/2019 | 12/13/2019 | 12/16/2019 | 03/08/2018 | 03/08/2018 | 03/08/2018 | 03/09/2018 | 03/09/2018 | 03/09/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0068 | <0.0072 | <0.0072 | <0.0074 | <0.0071 | <0.0069 | <0.0074 | <0.0074 | <0.0073 | <0.0076 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | 0.0035 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0068 | <0.0072 | <0.0072 | <0.0074 | <0.0071 | <0.0069 | <0.0074 | <0.0074 | <0.0073 | <0.0076 | - | - | - | - | - | - |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | - | - | - | - | - | - |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0096 | <0.01 | <0.0096 | <0.0096 | <0.01 | <0.0096 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | 0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.0038 | 0.0029 | 0.003 | 0.0033 | 0.0031 | 0.0034 | 0.0035 | 0.0023 | <0.0018 | <0.0019 | 0.002 | <0.002 | <0.0019 | <0.0019 | <0.002 | <0.0019 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.0038 | 0.0029 | 0.003 | 0.0033 | 0.0031 | 0.0034 | 0.0035 | 0.0023 | ND | ND | 0.002 | ND | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0036 | <0.0037 | <0.0035 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0038 | <0.0048 | <0.005 | <0.0048 | <0.0048 | <0.005 | <0.0048 |
| Total PFAS (Calculated) | NCL | NCL | 0.0038 | 0.0029 | 0.003 | 0.007 | 0.0031 | 0.0069 | 0.0035 | 0.0023 | ND | ND | 0.002 | ND | ND | ND | ND | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-PMW-14 | HS-PMW-14 | HS-MW-14D | HS-MW-14D | HS-MW-14D | HS-MW-14D | HS-MW-14D | HS-MW-14D | HS-MW-14M | HS-MW-14M | HS-MW-14M | HS-MW-14M | HS-MW-14M | HS-MW-14S | HS-MW-14S | HS-MW-14S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | PMW-14 93-98 | PMW-14 103-108 | PMW-14D | HS-MW-14D | HS-MW-14D DUP | HS-GW-MW14D | HS-GW-MW14D | HS-GW-MW-14D | PMW-14M | HS-MW-14M | HS-GW-MW14M | HS-GW-MW14M | HS-GW-MW-14M | PMW-14S | HS-MW-14S | HS-GW-MW14S |
| Well Screen Interval (Feet below ground surface) | | | 93-98 | 103-108 | 109-114 | 109-114 | 109-114 | 109-114 | 109-114 | 109-114 | 68.1-73.1 | 68.1-73.1 | 68.1-73.1 | 68.1-73.1 | 68.1-73.1 | 13-23 | 13-23 | 13-23 |
| Laboratory Sample ID | | | K1802247-006 | K1802302-001 | TD12015-001 | UB27031-003 | UB27031-004 | UE18016-008 | UI12010-007 | UK29008-016 | TD12015-003 | UB27031-001 | UE18016-009 | UI12010-009 | UK29008-015 | TD12015-005 | UB27031-002 | UE18016-010 |
| Sample Date | | | 03/09/2018 | 03/12/2018 | 04/10/2018 | 02/26/2019 | 02/26/2019 | 05/17/2019 | 09/10/2019 | 11/25/2019 | 04/10/2018 | 02/26/2019 | 05/17/2019 | 09/10/2019 | 11/25/2019 | 04/10/2018 | 02/26/2019 | 05/17/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0052 | <0.0046 | <0.0072 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0073 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0073 | <0.0036 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0052 | <0.0046 | <0.0072 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0073 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0073 | <0.0036 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0052 | <0.0046 | <0.0072 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0073 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0073 | <0.0036 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | <0.0052 | <0.0046 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0052 | <0.0046 | <0.014 | <0.0075 | <0.0073 | <0.0074 | <0.0074 | <0.007 | <0.015 | <0.0071 | <0.0073 | <0.0075 | <0.0069 | <0.015 | <0.0071 | <0.0072 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | <0.0052 | <0.0046 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | - | - | <0.0072 | <0.0075 | <0.0073 | <0.0074 | <0.0074 | <0.007 | <0.0073 | <0.0071 | <0.0073 | <0.0075 | <0.0069 | <0.0073 | <0.0071 | <0.0072 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0052 | <0.0046 | <0.0072 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0073 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0073 | <0.0036 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | - | - | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.01 | <0.0093 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | 0.005 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | 0.0065 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0021 | <0.0019 | <0.0036 | <0.0019 | <0.0018 | <0.0019 | <0.0019 | <0.0017 | <0.0036 | <0.0018 | <0.0018 | <0.0019 | <0.0017 | <0.0037 | <0.0018 | 0.0047 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0047 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | 0.0054 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0052 | <0.0046 | <0.0072 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0073 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0073 | <0.0036 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0052 | <0.0046 | <0.0036 | <0.0037 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0034 | <0.0037 | <0.0036 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.022 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-14S | HS-MW-14S | HS-PMW-15 | HS-PMW-15 | HS-PMW-15 | HS-PMW-15 | HS-MW-15D | HS-MW-15D | HS-MW-15D | HS-MW-15D | HS-MW-15D | HS-MW-15M | HS-MW-15M | HS-MW-15M | HS-MW-15M | HS-MW-15M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW14S | HS-GW-MW-14S | PMW152530 | PMW154550 | PMW15110115 | PMW15D110115 | PMW-15D | HS-MW-15D | HS-GW-MW15D | HS-GW-MW15D | HS-GW-MW-15D | PMW-15I | HS-MW-15M | HS-GW-MW15M | HS-GW-MW15M | HS-GW-MW-15M |
| Well Screen Interval (Feet below ground surface) | | | 13-23 | 13-23 | 25-30 | 45-30 | 110-115 | 110-115 | 108.6-118.6 | 108.6-118.6 | 108.6-118.6 | 108.6-118.6 | 108.6-118.6 | 44.8-49.8 | 44.8-49.8 | 44.8-49.8 | 44.8-49.8 | 44.8-49.8 |
| Laboratory Sample ID | | | UI12010-008 | UK29008-014 | K1713825-001 | K1713825-003 | K1713825-005 | K1713825-006 | K1802511-008 | UB28086-006 | UE18016-005 | UI21016-005 | UK19008-012 | K1802511-007 | UB28086-005 | UE18016-006 | UI21016-004 | UK21036-009 |
| Sample Date | | | 09/10/2019 | 11/25/2019 | 12/19/2017 | 12/20/2017 | 12/21/2017 | 12/21/2017 | 03/15/2018 | 02/27/2019 | 05/16/2019 | 09/19/2019 | 11/20/2019 | 03/15/2018 | 02/27/2019 | 05/16/2019 | 09/19/2019 | 11/19/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | - | - | - | - | <0.0047 | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0072 | <0.0069 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0075 | <0.0073 | <0.0073 | <0.0069 | <0.0047 | <0.0074 | <0.0076 | <0.0075 | <0.0073 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | - | - | - | - | <0.0047 | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0072 | <0.0069 | - | - | - | - | - | <0.0075 | <0.0073 | <0.0073 | <0.0069 | - | <0.0074 | <0.0076 | <0.0075 | <0.0073 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | <0.0034 | - | - | - | - | - | <0.0037 | <0.0037 | <0.0036 | <0.0034 | - | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | <0.0034 | <0.0083 | <0.0083 | <0.0083 | <0.01 | <0.0094 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0094 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.0023 | <0.0017 | <0.0017 | <0.0017 | <0.0017 | <0.002 | <0.0019 | <0.0019 | <0.0018 | <0.0018 | <0.0017 | <0.0019 | <0.0018 | <0.0019 | <0.0019 | <0.0018 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | 0.0036 | <0.0034 | <0.0042 | ***0.066*** | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.0059 | ND | ND | 0.066 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.005 | <0.0047 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0047 | <0.0037 | <0.0038 | <0.0037 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.0059 | ND | ND | 0.066 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-15S | HS-MW-15S | HS-MW-15S | HS-MW-15S | HS-MW-15S | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 | HS-PMW-17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | PMW-15S | HS-MW-15S | HS-GW-MW15S | HS-GW-MW15S | HS-GW-MW-15S | PMW-17 83-88 | PMW-17 93-98 | PMW-17 103-108 | PMW-17 113-118 | PMW-17 153-158 | PMW-17 163-168 | PMW-17 173-178 | PMW-17-183'-188'-2/19 | PMW-17-193'-198'-2/20 | PMW-17-203'-208'-2/20 | PMW-17-213'-218'-2/22 |
| Well Screen Interval (Feet below ground surface) | | | 6.9-16.9 | 6.9-16.9 | 6.9-16.9 | 6.9-16.9 | 6.9-16.9 | 83-88 | 93-98 | 103-108 | 113-118 | 153-158 | 163-168 | 173-178 | 183-188 | 193-198 | 203-208 | 213-218 |
| Laboratory Sample ID | | | K1802511-006 | UB28086-004 | UE18016-007 | UI21016-003 | UK21036-010 | K1801045-003 | K1801045-004 | K1801045-007 | K1801045-008 | K1801045-011 | K1801593-002 | K1801593-004 | K1801660-001 | K1801660-004 | K1801660-007 | K1801740-001 |
| Sample Date | | | 03/15/2018 | 02/27/2019 | 05/16/2019 | 09/19/2019 | 11/19/2019 | 01/30/2018 | 01/30/2018 | 01/31/2018 | 01/31/2018 | 02/02/2018 | 02/16/2018 | 02/16/2018 | 02/19/2018 | 02/20/2018 | 02/20/2018 | 02/22/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | <0.0046 | - | - | - | - | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0046 | <0.0074 | <0.0073 | <0.0077 | <0.0069 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | <0.0046 | - | - | - | - | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.0086 | 0.0073 | 0.0058 | 0.0068 | 0.0073 | <0.0042 | <0.0042 | 0.0057 | 0.0069 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | 0.026 | 0.14 | 0.4 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | 0.067 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | - | <0.0074 | <0.0073 | <0.0077 | <0.0069 | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | - | <0.0037 | <0.0036 | <0.0038 | <0.0034 | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | 0.004 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | 0.0068 | 0.29 | 0.89 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0093 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0084 | <0.0084 | <0.0084 | <0.0084 | <0.0084 | <0.0094 | <0.0094 | <0.0093 | 0.015 | 0.029 | 0.089 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | 0.007 | 0.1 | 0.32 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | 0.0055 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | 0.023 | 0.11 | 0.27 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0019 | <0.0018 | <0.0018 | <0.0019 | 0.0018 | <0.0017 | <0.0017 | 0.0044 | 0.0077 | <0.0017 | 0.0038 | 0.0023 | <0.0019 | 0.005 | 0.2 | 0.72 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | 0.0063 | 0.0045 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | ***0.039*** |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | 0.0018 | ND | ND | 0.011 | 0.012 | ND | 0.0038 | 0.0023 | ND | 0.005 | 0.2 | 0.76 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | 0.017 | 0.038 | 0.13 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0046 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0042 | <0.0047 | <0.0047 | <0.0046 | <0.0046 | <0.0048 | <0.0046 |
| Total PFAS (Calculated) | NCL | NCL | 0.0086 | 0.0073 | 0.0058 | 0.0068 | 0.013 | ND | ND | 0.016 | 0.025 | ND | 0.0038 | 0.0023 | ND | 0.1 | 0.91 | 2.9 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-17D | HS-MW-17D | HS-MW-17D | HS-MW-17D | HS-MW-17D | HS-MW-17M | HS-MW-17M | HS-MW-17M | HS-MW-17M | HS-MW-17M | HS-MW-17S | HS-MW-17S | HS-MW-17S | HS-MW-17S | HS-MW-17S | HS-PMW-18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | MW-17D | HS-MW-17D | HS-GW-MW17D | HS-GW-MW17D | HS-GW-MW-17D | MW-17M | HS-MW-17M | HS-GW-MW17M | HS-GW-MW17M | HS-GW-MW-17M | MW-17S | HS-MW-17S | HS-GW-MW17S | HS-GW-MW17S | HS-GW-MW-17S | PMW-18-14-19 |
| Well Screen Interval (Feet below ground surface) | | | 222.1-227.1 | 222.1-227.1 | 222.1-227.1 | 222.1-227.1 | 222.1-227.1 | 167.3-172.3 | 167.3-172.3 | 167.3-172.3 | 167.3-172.3 | 167.3-172.3 | 105.8-110.8 | 105.8-110.8 | 105.8-110.8 | 105.8-110.8 | 105.8-110.8 | 14-19 |
| Laboratory Sample ID | | | K1803589-002 | UC09042-006 | UE25011-001 | UI19006-002 | UL12091-010 | K1803589-003 | UC09042-005 | UE25011-003 | UI12010-016 | UL12091-012 | K1803589-001 | UC09042-003 | UE25011-002 | UI12010-014 | UL12091-007 | TE17021-002 |
| Sample Date | | | 04/17/2018 | 03/07/2019 | 05/23/2019 | 09/16/2019 | 12/10/2019 | 04/17/2018 | 03/07/2019 | 05/23/2019 | 09/11/2019 | 12/11/2019 | 04/17/2018 | 03/06/2019 | 05/23/2019 | 09/11/2019 | 12/10/2019 | 05/14/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | <0.0046 | - | - | - | - | <0.0045 | - | - | - | - | <0.0049 | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0046 | <0.007 | <0.007 | <0.007900001 | <0.0074 | <0.0045 | <0.0074 | <0.0071 | <0.0066 | <0.0068 | <0.0049 | <0.0071 | <0.0069 | <0.0067 | <0.0075 | <0.0069 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | <0.0046 | - | - | - | - | <0.0045 | - | - | - | - | <0.0049 | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.44 | 0.43 | 0.41 | 0.47 | 0.42 | <0.0045 | 0.004 | 0.0039 | 0.0036 | 0.0038 | <0.0049 | 0.014 | 0.02 | 0.014 | 0.018 | 0.0051 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | 0.081 | 0.022 | 0.024 | 0.028 | 0.029 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | - | <0.007 | <0.007 | <0.007900001 | <0.0074 | - | <0.0074 | <0.0071 | <0.0066 | <0.0068 | - | <0.0071 | <0.0069 | <0.0067 | <0.0075 | <0.0069 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | - | 0.56 | 0.5 | 0.57 | 0.49 | - | <0.0037 | <0.0036 | <0.0033 | <0.0034 | - | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 1.2 | 0.96 | 1 | 1.1 | 1 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.14 | 0.11 | 0.11 | 0.12 | 0.12 | <0.0089 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0098 | 0.0041 | 0.0058 | 0.0034 | 0.0042 | <0.0035 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.51 | 0.3 | 0.3 | 0.33 | 0.31 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.42 | 0.27 | 0.31 | 0.27 | 0.28 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | 0.0054 | <0.0035 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 1.3 | 1 | 1.2 | 1.2 | 1.1 | <0.0018 | <0.0019 | <0.0018 | <0.0017 | <0.0017 | <0.002 | <0.0018 | <0.0017 | <0.0017 | <0.0019 | <0.0017 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.072*** | ***0.06*** | ***0.058*** | ***0.072*** | ***0.076*** | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| PFOA + PFOS (Calculated) | NCL | NCL | 1.4 | 1.1 | 1.3 | 1.3 | 1.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.16 | 0.12 | 0.13 | 0.13 | 0.14 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | 0.0044 | 0.0048 | 0.0073 | <0.0035 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0046 | <0.0035 | <0.0035 | <0.004 | <0.0037 | <0.0045 | <0.0037 | <0.0036 | <0.0033 | <0.0034 | <0.0049 | <0.0035 | <0.0035 | <0.0033 | <0.0038 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | 4.3 | 3.8 | 4 | 4.3 | 4 | ND | 0.004 | 0.0039 | 0.0036 | 0.0038 | ND | 0.018 | 0.03 | 0.022 | 0.035 | 0.0051 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-PMW-18 | HS-MW-18D | HS-MW-18D | HS-MW-18D | HS-MW-18D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | PMW-18-24-29 | PMW-18-34-39 | PMW-18-44-49 | PMW-18-54-59 | PMW-18-64-69 | PMW-18-74-79 | PMW-18-84-89 | PMW-18-94-99 | PMW-18-104-109 | PMW-18-114-119 | PMW-18-124-129 | PMW-18-134-139 | MW-18D | HS-MW-18D | HS-GW-MW18D | HS-GW-MW18D |
| Well Screen Interval (Feet below ground surface) | | | 24-29 | 34-39 | 44-49 | 54-59 | 64-69 | 74-79 | 84-89 | 94-89 | 104-109 | 114-119 | 124-129 | 134-139 | 140.6-145.6 | 140.6-145.6 | 140.6-145.6 | 140.6-145.6 |
| Laboratory Sample ID | | | TE17021-004 | TE17021-005 | TE17021-006 | TE17021-007 | TE17021-008 | TE17021-011 | TE17021-012 | TE17020-001 | TE17020-004 | TE17020-005 | TE17020-006 | TE17020-007 | TG07027-006 | UC02020-006 | UE24001-004 | UI12010-006 |
| Sample Date | | | 05/15/2018 | 05/15/2018 | 05/15/2018 | 05/15/2018 | 05/15/2018 | 05/15/2018 | 05/15/2018 | 05/16/2018 | 05/16/2018 | 05/16/2018 | 05/16/2018 | 05/16/2018 | 07/06/2018 | 03/01/2019 | 05/21/2019 | 09/10/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.007 | <0.007 | <0.0072 | <0.007 | <0.0072 | <0.007 | <0.007 | <0.0074 | <0.0071 | <0.0072 | <0.0071 | <0.0071 | <0.007 | <0.0073 | <0.0074 | <0.0068 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.0062 | <0.0035 | <0.0036 | <0.0035 | 0.0056 | 0.01 | 0.015 | 0.033 | 0.14 | 0.14 | 0.18 | 0.17 | 0.024 | 0.029 | 0.031 | 0.025 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | 0.011 | 0.034 | 0.03 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.007 | <0.007 | <0.0072 | <0.007 | <0.0072 | <0.007 | <0.007 | <0.0074 | <0.0071 | <0.0072 | <0.0071 | <0.0071 | <0.007 | <0.0073 | <0.0074 | <0.0068 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | 0.0064 | 0.013 | 0.041 | 0.16 | 0.17 | 0.13 | 0.098 | 0.011 | 0.015 | 0.014 | 0.012 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.0043 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | 0.011 | 0.026 | 0.09 | 0.35 | 0.32 | 0.13 | 0.06 | 0.0058 | 0.0074 | 0.0082 | 0.0062 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.0089 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | 0.0074 | 0.028 | 0.03 | 0.059 | 0.06 | 0.016 | 0.018 | 0.02 | 0.018 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | 0.0035 | 0.0071 | 0.019 | 0.082 | 0.087 | 0.084 | 0.07 | 0.0095 | 0.011 | 0.011 | 0.01 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | 0.0052 | 0.0072 | 0.017 | 0.079 | 0.084 | 0.12 | 0.12 | 0.019 | 0.022 | 0.024 | 0.021 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0017 | <0.0017 | <0.0018 | <0.0017 | 0.0022 | 0.011 | 0.026 | 0.083 | 0.33 | 0.33 | 0.18 | 0.1 | 0.0092 | 0.014 | 0.015 | 0.015 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | 0.011 | ***0.043*** | ***0.098*** | ***0.084*** | 0.0045 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | 0.0022 | 0.011 | 0.037 | 0.13 | 0.43 | 0.41 | 0.18 | 0.1 | 0.0092 | 0.014 | 0.015 | 0.015 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | 0.0073 | 0.03 | 0.032 | 0.057 | 0.06 | 0.014 | 0.015 | 0.017 | 0.016 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0034 |
| Total PFAS (Calculated) | NCL | NCL | 0.019 | ND | ND | ND | 0.0078 | 0.047 | 0.11 | 0.35 | 1.3 | 1.3 | 0.94 | 0.74 | 0.11 | 0.13 | 0.14 | 0.12 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-18D | HS-MW-18S | HS-MW-18S | HS-MW-18S | HS-MW-18S | HS-MW-18S | HS-PMW-19 | HS-PMW-19 | HS-PMW-19 | HS-PMW-19 | HS-MW-19D | HS-MW-19D | HS-MW-19D | HS-MW-19D | HS-MW-19D | HS-MW-19S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW-18D | MW-18S | HS-MW-18S | HS-GW-MW18S | HS-GW-MW18S | HS-GW-MW-18S | PMW-19 55-60 | Dupe-1 | PMW-19 80-85 | PMW-19 90-95 | PMW-19D | HS-MW-19D | HS-GW-MW19D | HS-GW-MW19D | HS-GW-MW-19D | PMW-19S |
| Well Screen Interval (Feet below ground surface) | | | 140.6-145.6 | 12.8-22.8 | 12.8-22.8 | 12.8-22.8 | 12.8-22.8 | 12.8-22.8 | 55-60 | 55-60 | 80-85 | 90-95 | 85.9-95.9 | 85.9-95.9 | 85.9-95.9 | 85.9-95.9 | 85.9-95.9 | 58.4-61.4 |
| Laboratory Sample ID | | | UK19008-015 | TG07027-005 | UC02020-007 | UE24001-005 | UI12010-010 | UK21036-020 | K1800413-001 | K1800413-004 | K1800413-006 | K1800413-007 | K1802511-009 | UC02020-005 | UE24001-007 | UI26001-003 | UL12091-019 | K1802511-010 |
| Sample Date | | | 11/20/2019 | 07/06/2018 | 03/01/2019 | 05/21/2019 | 09/10/2019 | 11/21/2019 | 01/09/2018 | 01/09/2018 | 01/10/2018 | 01/10/2018 | 03/16/2018 | 02/28/2019 | 05/21/2019 | 09/23/2019 | 12/12/2019 | 03/16/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | - | - | - | - | <0.0045 |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0075 | <0.007 | <0.0074 | <0.0073 | <0.0068 | <0.007 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.007 | <0.007 | <0.0069 | <0.0072 | <0.0045 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | - | - | - | - | <0.0045 |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.029 | <0.0035 | 0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0075 | <0.007 | <0.0074 | <0.0073 | <0.0068 | <0.007 | - | - | - | - | - | <0.007 | <0.007 | <0.0069 | <0.0072 | - |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.014 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | - | - | - | - | - | <0.0035 | <0.0035 | <0.0034 | <0.0036 | - |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.0072 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | 0.0043 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.02 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0086 | <0.0083 | <0.0086 | <0.0083 | <0.0098 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0091 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.011 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.022 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.015 | <0.0018 | <0.0019 | <0.0018 | <0.0017 | <0.0017 | <0.0017 | <0.0017 | <0.0017 | <0.0017 | <0.002 | <0.0018 | <0.0018 | <0.0017 | <0.0018 | <0.0018 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | 0.0075 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.015 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0075 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.016 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0043 | <0.0042 | <0.0043 | <0.0042 | <0.0049 | <0.0035 | <0.0035 | <0.0034 | <0.0036 | <0.0045 |
| Total PFAS (Calculated) | NCL | NCL | 0.13 | ND | 0.0037 | ND | ND | 0.0043 | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0075 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-19S | HS-MW-19S | HS-MW-19S | HS-MW-19S | HS-PMW-20 | HS-PMW-20 | HS-PMW-20 | HS-PMW-20 | HS-PMW-20 | HS-PMW-20 | HS-PMW-20 | HS-MW-20D | HS-MW-20D | HS-MW-20D | HS-MW-20D | HS-MW-20M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-MW-19S | HS-GW-MW19S | HS-GW-MW19S | HS-GW-MW-19S | SB-20 60-65 | SB-20 70-75 | SB-20 80-85 | SB-20 90-95 | SB-20 100-105 | SB-20 110-115 | SB-20 120-125 | HS-MW-20D | HS-GW-MW20D | HS-GW-MW20D | HS-GW-MW-20D | HS-MW-20M |
| Well Screen Interval (Feet below ground surface) | | | 58.4-61.4 | 58.4-61.4 | 58.4-61.4 | 58.4-61.4 | 60-65 | 70-75 | 80-85 | 90-95 | 100-105 | 110-115 | 120-125 | 126.1-131.1 | 126.1-131.1 | 126.1-131.1 | 126.1-131.1 | 101.5-106.5 |
| Laboratory Sample ID | | | UC02020-004 | UE24001-006 | UI26001-002 | UL12091-016 | TJ21003-001 | TJ21003-002 | TJ21003-005 | TJ21003-006 | TJ21003-007 | TJ21003-008 | TJ21003-011 | UC09042-002 | UE30036-003 | UI19006-022 | UK29008-019 | UC09042-001 |
| Sample Date | | | 02/28/2019 | 05/21/2019 | 09/23/2019 | 12/11/2019 | 10/15/2018 | 10/15/2018 | 10/16/2018 | 10/16/2018 | 10/16/2018 | 10/16/2018 | 10/17/2018 | 03/06/2019 | 05/28/2019 | 09/18/2019 | 11/27/2019 | 03/06/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0081 | <0.0069 | <0.0077 | <0.0072 | <0.007 | <0.007 | <0.007 | <0.007 | <0.0071 | <0.0071 | <0.0071 | <0.0071 | <0.0073 | <0.007 | <0.0069 | <0.0074 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | 0.014 | 0.0035 | 0.018 | 0.05 | 0.068 | 0.11 | 0.15 | 0.16 | 0.17 | 0.17 | 0.15 | 0.071 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | 0.0067 | 0.0066 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | 0.0095 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0081 | <0.0069 | <0.0077 | <0.0072 | <0.007 | <0.007 | <0.007 | <0.007 | <0.0071 | <0.0071 | <0.0071 | <0.0071 | <0.0073 | <0.007 | <0.0069 | <0.0074 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | 0.0081 | <0.0035 | 0.022 | 0.058 | 0.079 | 0.11 | 0.1 | 0.097 | 0.098 | 0.11 | 0.098 | 0.083 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | 0.0051 | <0.0035 | 0.044 | 0.11 | 0.13 | 0.11 | 0.053 | 0.042 | 0.042 | 0.046 | 0.043 | 0.16 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | 0.0036 | <0.0035 | 0.0045 | 0.012 | 0.015 | 0.027 | 0.043 | 0.047 | 0.052 | 0.05 | 0.049 | 0.015 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | 0.0054 | <0.0035 | 0.011 | 0.03 | 0.042 | 0.06 | 0.066 | 0.07 | 0.078 | 0.077 | 0.076 | 0.043 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | 0.0074 | <0.0035 | 0.012 | 0.028 | 0.041 | 0.069 | 0.11 | 0.088 | 0.1 | 0.1 | 0.1 | 0.038 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.002 | <0.0017 | <0.0019 | <0.0018 | 0.0084 | 0.0053 | 0.041 | 0.1 | 0.13 | 0.13 | 0.096 | 0.09 | 0.12 | 0.12 | 0.11 | 0.16 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | 0.011 | ***0.023*** | ***0.019*** | 0.0081 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | ***0.04*** |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | 0.0084 | 0.0053 | 0.052 | 0.12 | 0.15 | 0.14 | 0.096 | 0.09 | 0.12 | 0.12 | 0.11 | 0.2 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | 0.0051 | 0.013 | 0.016 | 0.032 | 0.046 | 0.045 | 0.054 | 0.052 | 0.049 | 0.017 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.004 | <0.0034 | <0.0038 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0037 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | ND | 0.052 | 0.0088 | 0.17 | 0.43 | 0.55 | 0.66 | 0.66 | 0.64 | 0.71 | 0.73 | 0.68 | 0.64 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-20M | HS-MW-20M | HS-MW-20M | HS-MW-20M | HS-MW-20S | HS-MW-20S | HS-MW-20S | HS-MW-20S | HS-PMW-21 | HS-PMW-21 | HS-PMW-21 | HS-PMW-21 | HS-PMW-21 | HS-MW-21D | HS-MW-21D | HS-MW-21D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW20M | HS-GW-MW20M | HS-GW-MW20M DUP | HS-GW-MW-20M | MW-20S | HS-GW-MW20S | HS-GW-MW20S | HS-GW-MW-20S | PMW-21 15-20 | PMW-21 25-30 | PMW-21 35-40 | PMW-21 55-60 | PMW-21 80-85 | PMW-21D | HS-MW-21D | HS-GW-MW21D |
| Well Screen Interval (Feet below ground surface) | | | 101.5-106.5 | 101.5-106.5 | 101.5-106.5 | 101.5-106.5 | 61.1-66.1 | 61.1-66.1 | 61.1-66.1 | 61.1-66.1 | 15-20 | 25-30 | 35-40 | 55-60 | 80-65 | 76.2-86.2 | 76.2-86.2 | 76.2-86.2 |
| Laboratory Sample ID | | | UE30036-002 | UI19006-020 | UI19006-021 | UK29008-002 | UC06036-001 | UE30036-001 | UI19006-019 | UK29008-001 | K1800184-001 | K1800184-002 | K1800184-003 | K1800184-004 | K1800184-005 | K1802511-005 | UB28086-003 | UE18016-001 |
| Sample Date | | | 05/28/2019 | 09/18/2019 | 09/18/2019 | 11/26/2019 | 03/04/2019 | 05/28/2019 | 09/18/2019 | 11/26/2019 | 01/02/2018 | 01/03/2018 | 01/03/2018 | 01/03/2018 | 01/03/2018 | 03/15/2018 | 02/27/2019 | 05/16/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0069 | <0.0069 | <0.007 | <0.0071 | <0.0071 | <0.0074 | <0.0071 | <0.007 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0072 | <0.0073 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.068 | 0.069 | 0.07 | 0.06 | 0.015 | 0.016 | 0.018 | 0.018 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | 0.0088 | 0.008 | 0.0084 | 0.0077 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0069 | <0.0069 | <0.007 | <0.0071 | <0.0071 | <0.0074 | <0.0071 | <0.007 | - | - | - | - | - | - | <0.0072 | <0.0073 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.079 | 0.08 | 0.085 | 0.062 | 0.013 | 0.013 | 0.016 | 0.012 | - | - | - | - | - | - | <0.0036 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.16 | 0.15 | 0.14 | 0.13 | 0.014 | 0.017 | 0.019 | 0.013 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.015 | 0.015 | 0.014 | 0.014 | 0.0042 | 0.0043 | 0.0047 | 0.0067 | <0.0086 | <0.0086 | <0.0083 | <0.0083 | <0.0086 | <0.0094 | <0.0036 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.042 | 0.039 | 0.045 | 0.038 | 0.0056 | 0.0082 | 0.0094 | 0.0092 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.038 | 0.036 | 0.034 | 0.034 | 0.0068 | 0.0085 | 0.0093 | 0.013 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.17 | 0.17 | 0.17 | 0.15 | 0.016 | 0.022 | 0.022 | 0.023 | 0.0022 | <0.0017 | <0.0017 | <0.0017 | <0.0017 | <0.0019 | <0.0018 | <0.0018 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.034*** | ***0.033*** | ***0.032*** | ***0.029*** | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | 0.0061 | <0.0036 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.2 | 0.2 | 0.2 | 0.18 | 0.016 | 0.022 | 0.022 | 0.023 | 0.0022 | ND | ND | ND | ND | 0.0061 | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.017 | 0.015 | 0.016 | 0.014 | <0.0036 | 0.0039 | 0.0045 | 0.0064 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0035 | <0.0043 | <0.0043 | <0.0042 | <0.0042 | <0.0043 | <0.0047 | <0.0036 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.63 | 0.62 | 0.61 | 0.54 | 0.075 | 0.093 | 0.1 | 0.1 | 0.0022 | ND | ND | ND | ND | 0.0061 | ND | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-21D | HS-MW-21D | HS-MW-21D | HS-MW-21D | HS-MW-21M | HS-MW-21M | HS-MW-21M | HS-MW-21M | HS-MW-21M | HS-MW-21S | HS-MW-21S | HS-MW-21S | HS-MW-21S | HS-MW-21S | HS-PMW-23 | HS-PMW-23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW21D DUP | HS-GW-MW21D | HS-GW-MW-21D | HS-GW-MW-21D DUP | PMW-21I | HS-MW-21M | HS-GW-MW21M | HS-GW-MW21M | HS-GW-MW-21M | PMW-21S | HS-MW-21S | HS-GW-MW21S | HS-GW-MW21S | HS-GW-MW-21S | PMW-23(10-20) | PMW-23(70-80) |
| Well Screen Interval (Feet below ground surface) | | | 76.2-86.2 | 76.2-86.2 | 76.2-86.2 | 76.2-86.2 | 59-64 | 59-64 | 59-64 | 59-64 | 59-64 | 9.8-19.8 | 9.8-19.8 | 9.8-19.8 | 9.8-19.8 | 9.8-19.8 | 10-20 | 70-80 |
| Laboratory Sample ID | | | UE18016-002 | UI19006-003 | UL12091-001 | UL12091-002 | K1802511-002 | UB28086-002 | UE18016-003 | UI19006-004 | UK29008-020 | K1802511-001 | UB28086-001 | UE18016-004 | UI19006-006 | UK29008-022 | UF15016-001 | UF15016-002 |
| Sample Date | | | 05/16/2019 | 09/16/2019 | 12/09/2019 | 12/09/2019 | 03/15/2018 | 02/27/2019 | 05/16/2019 | 09/16/2019 | 11/27/2019 | 03/15/2018 | 02/27/2019 | 05/16/2019 | 09/16/2019 | 11/27/2019 | 06/10/2019 | 06/11/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | 0.0058 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | <0.0047 | - | - | - | - | <0.0047 | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0073 | <0.0072 | <0.0072 | <0.0071 | <0.0047 | <0.0075 | <0.0073 | <0.0071 | <0.0074 | <0.0047 | <0.0073 | <0.0074 | <0.0074 | <0.007 | <0.0072 | <0.0069 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | <0.0047 | - | - | - | - | <0.0047 | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | 0.0036 | 0.037 | 0.015 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0073 | <0.0072 | <0.0072 | <0.0071 | - | <0.0075 | <0.0073 | <0.0071 | <0.0074 | - | <0.0073 | <0.0074 | <0.0074 | <0.007 | <0.0072 | <0.0069 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | - | <0.0037 | <0.0036 | <0.0036 | <0.0037 | - | <0.0037 | <0.0037 | <0.0037 | <0.0035 | 0.034 | 0.011 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | 0.072 | 0.032 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0094 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0094 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | 0.0085 | <0.0035 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | 0.0078 | <0.0035 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0019 | <0.0019 | <0.0018 | <0.0018 | <0.0019 | 0.0056 | 0.0028 | 0.0026 | 0.0034 | 0.0031 | 0.015 | 0.013 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | ***0.017*** | <0.0037 | <0.0036 | <0.0036 | <0.0037 | 0.0092 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | 0.0057 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | 0.017 | ND | ND | ND | ND | 0.015 | 0.0028 | 0.0026 | 0.0034 | 0.0031 | 0.015 | 0.019 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0047 | <0.0037 | <0.0036 | <0.0036 | <0.0037 | <0.0047 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | ND | 0.0058 | ND | ND | 0.017 | ND | ND | ND | ND | 0.015 | 0.0028 | 0.0026 | 0.0034 | 0.0067 | 0.17 | 0.077 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 | HS-PMW-23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | PMW-23(80-90) | PMW-23(90-100) | PMW-23(100-110) | PMW-23(110-120) | PMW-23(120-130) | PMW-23(130-140) | PMW-23(140-150) | PMW-23(150-160) | PMW-23(160-170) | PMW-23(170-180) | PMW-23(180-190) | PMW-23(190-200) | PMW-23(200-210) | PMW-23(210-220) | PMW-23(220-230) | PMW-23(230-240) |
| Well Screen Interval (Feet below ground surface) | | | 80-90 | 90-100 | 100-110 | 110-120 | 120-130 | 130-140 | 140-150 | 150-160 | 160-170 | 170-180 | 180-190 | 190-200 | 200-210 | 210-220 | 220-230 | 230-240 |
| Laboratory Sample ID | | | UF15016-003 | UF15016-004 | UF15016-005 | UF15016-006 | UF15016-007 | UF15016-008 | UF15016-009 | UF15016-010 | UF15016-011 | UF15016-012 | UF15016-013 | UF15016-014 | UF20036-001 | UF20036-002 | UF20036-003 | UF20036-004 |
| Sample Date | | | 06/11/2019 | 06/11/2019 | 06/11/2019 | 06/12/2019 | 06/12/2019 | 06/12/2019 | 06/12/2019 | 06/13/2019 | 06/13/2019 | 06/13/2019 | 06/14/2019 | 06/14/2019 | 06/17/2019 | 06/17/2019 | 06/18/2019 | 06/18/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0069 | <0.007 | <0.0071 | <0.0072 | <0.0071 | <0.007 | <0.0071 | <0.007 | <0.0071 | <0.0071 | <0.0073 | <0.007 | <0.0069 | <0.007 | <0.007 | <0.0069 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.0091 | <0.0035 | <0.0035 | <0.0036 | 0.0042 | 0.069 | 0.086 | 0.057 | 0.16 | 0.15 | 0.23 | 0.22 | 0.38 | 0.28 | 0.25 | 0.25 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0069 | <0.007 | <0.0071 | <0.0072 | <0.0071 | <0.007 | <0.0071 | <0.007 | <0.0071 | <0.0071 | <0.0073 | <0.007 | <0.0069 | <0.007 | <0.007 | <0.0069 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.0046 | <0.0035 | <0.0035 | <0.0036 | 0.0054 | 0.056 | 0.069 | 0.052 | 0.13 | 0.092 | 0.16 | 0.19 | 0.3 | 0.19 | 0.14 | 0.15 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.0076 | <0.0035 | <0.0035 | 0.0041 | 0.012 | 0.06 | 0.086 | 0.062 | 0.11 | 0.031 | 0.052 | 0.071 | 0.11 | 0.064 | 0.021 | 0.017 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | 0.012 | 0.014 | 0.0097 | 0.028 | 0.026 | 0.049 | 0.052 | 0.084 | 0.067 | 0.072 | 0.071 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | 0.013 | 0.015 | 0.012 | 0.025 | 0.022 | 0.042 | 0.041 | 0.066 | 0.044 | 0.044 | 0.043 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | 0.056 | 0.058 | 0.042 | 0.11 | 0.092 | 0.18 | 0.18 | 0.33 | 0.26 | 0.27 | 0.25 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.0049 | <0.0017 | <0.0018 | 0.003 | 0.0049 | 0.02 | 0.028 | 0.02 | 0.037 | 0.02 | 0.033 | 0.03 | 0.047 | 0.03 | 0.017 | 0.015 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | 0.0054 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | 0.0048 | 0.005 | 0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.01 | ND | ND | 0.003 | 0.0049 | 0.025 | 0.033 | 0.024 | 0.037 | 0.02 | 0.033 | 0.03 | 0.047 | 0.03 | 0.017 | 0.015 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | 0.02 | 0.019 | 0.013 | 0.036 | 0.038 | 0.069 | 0.081 | 0.13 | 0.11 | 0.13 | 0.13 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | 0.032 | ND | ND | 0.0071 | 0.027 | 0.31 | 0.38 | 0.27 | 0.64 | 0.47 | 0.82 | 0.87 | 1.4 | 1 | 0.94 | 0.93 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-23A | HS-MW-23A | HS-MW-23B | HS-MW-23B | HS-MW-23D | HS-MW-23C | HS-MW-23C | HS-MW-23D | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW23A | HS-GW-MW-23A | HS-GW-MW23B | HS-GW-MW-23B | HS-GW-MW23D | HS-GW-MW-23C | HS-GW-MW23C | HS-GW-MW-23D | MW-24A (55-60) | MW-24A (65-70) | MW-24A (75-80) | MW-24A (85-90) | MW-24A (95-100) | MW-24A (105-110) | MW-24A (115-120) | MW-24A (125-130) |
| Well Screen Interval (Feet below ground surface) | | | 72.1-77.1 | 72.1-77.1 | 137.9-142.8 | 137.9-142.8 | 238.9-243.9 | 210.2-215 | 210.2-215 | 238.9-243.9 | 55-60 | 65-70 | 75-80 | 85-90 | 95-100 | 105-110 | 115-120 | 125-130 |
| Laboratory Sample ID | | | UI21016-007 | UL05055-032 | UI21016-009 | UL05055-033 | UI21016-008 | UL05055-034 | UI26001-001 | UL12091-008 | UI26018-001 | UI26018-002 | UI26018-003 | UI26018-004 | UI26018-005 | UI26018-006 | UI26018-007 | UI26018-008 |
| Sample Date | | | 09/20/2019 | 12/06/2019 | 09/20/2019 | 12/06/2019 | 09/20/2019 | 12/06/2019 | 09/23/2019 | 12/10/2019 | 09/23/2019 | 09/23/2019 | 09/23/2019 | 09/24/2019 | 09/24/2019 | 09/24/2019 | 09/24/2019 | 09/24/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0072 | <0.0071 | <0.0068 | <0.007 | <0.0069 | <0.0071 | <0.007 | <0.0072 | <0.0068 | <0.0068 | <0.007 | <0.0072 | <0.007 | <0.007 | <0.0068 | <0.007 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.02 | 0.018 | 0.015 | 0.014 | 0.23 | 0.28 | 0.26 | 0.14 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0072 | <0.0071 | <0.0068 | <0.007 | <0.0069 | <0.0071 | <0.007 | <0.0072 | <0.0068 | <0.0068 | <0.007 | <0.0072 | <0.007 | <0.007 | <0.0068 | <0.007 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.011 | 0.0094 | 0.0081 | 0.0071 | 0.15 | 0.23 | 0.22 | 0.076 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.02 | 0.019 | 0.019 | 0.015 | 0.016 | 0.09 | 0.091 | 0.011 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | 0.067 | 0.067 | 0.064 | 0.043 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | 0.037 | 0.057 | 0.05 | 0.02 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.0047 | <0.0035 | 0.0061 | 0.0044 | 0.24 | 0.26 | 0.22 | 0.16 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.013 | 0.012 | 0.0075 | 0.0082 | 0.013 | 0.03 | 0.03 | 0.0056 | <0.0017 | <0.0017 | <0.0017 | <0.0018 | <0.0017 | <0.0018 | <0.0017 | <0.0017 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | 0.0042 | ***0.015*** | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.017 | 0.027 | 0.0075 | 0.0082 | 0.013 | 0.03 | 0.03 | 0.0056 | ND | ND | ND | ND | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | 0.13 | 0.11 | 0.1 | 0.08 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0034 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | 0.073 | 0.073 | 0.056 | 0.049 | 0.88 | 1.1 | 1 | 0.54 | ND | ND | ND | ND | ND | ND | ND | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-PMW-24 | HS-MW-24A | HS-MW-24B | HS-PMW-25 | HS-PMW-25 | HS-PMW-25 | HS-MW-25D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | MW-24A(135-140) | MW-24A(145-150) | MW-24A(155-160) | MW-24A(165-170) | MW-24A(175-180) | MW-24A(185-190) | MW-24A(195-200) | HS-MW24 205-210 | HS-MW24 215-220 | HS-MW24 225-230 | HS-GW-MW-24A | HS-GW-MW-24B | SB-25 41-46 | SB-25 55-60 | SB-25 65-70 | HS-MW-25D |
| Well Screen Interval (Feet below ground surface) | | | 135-140 | 145-150 | 155-160 | 165-170 | 175-180 | 185-190 | 195-200 | 205-210 | 215-220 | 225-230 | 55.6-60.4 | 225.2-230 | 41-46 | 55-60 | 65-70 | 65.7-70.7 |
| Laboratory Sample ID | | | UI28012-001 | UI28012-002 | UI28012-003 | UI28012-004 | UI28012-005 | UI28012-006 | UI28012-007 | UJ02010-001 | UJ02010-002 | UJ02010-003 | UL12091-009 | UL12091-015 | TJ05091-003 | TJ05091-004 | TJ05091-005 | UC02020-009 |
| Sample Date | | | 09/25/2019 | 09/25/2019 | 09/25/2019 | 09/26/2019 | 09/26/2019 | 09/26/2019 | 09/27/2019 | 09/30/2019 | 09/30/2019 | 09/30/2019 | 12/10/2019 | 12/11/2019 | 10/03/2018 | 10/03/2018 | 10/03/2018 | 03/01/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0073 | <0.007 | <0.0071 | <0.0071 | <0.0068 | <0.007 | <0.0069 | <0.0076 | <0.0072 | <0.0072 | <0.007 | <0.0074 | <0.0074 | <0.0074 | <0.0073 | <0.0072 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | 0.0039 | 0.012 | 0.0099 | 0.016 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0073 | <0.007 | <0.0071 | <0.0071 | <0.0068 | <0.007 | <0.0069 | <0.0076 | <0.0072 | <0.0072 | <0.007 | <0.0074 | <0.0074 | <0.0074 | <0.0073 | <0.0072 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | 0.0065 | 0.005 | 0.008 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | 0.01 | 0.005 | 0.0038 | 0.0054 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | 0.0055 | <0.0037 | 0.0056 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | 0.0049 | 0.011 | 0.0075 | 0.011 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0017 | <0.0017 | <0.0017 | <0.0019 | <0.0018 | <0.0018 | <0.0017 | <0.0018 | 0.0062 | 0.018 | 0.012 | 0.016 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | 0.011 | ***0.08*** | ***0.05*** | ***0.072*** |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.017 | 0.098 | 0.062 | 0.088 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | 0.0089 | 0.006 | 0.0091 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0037 | <0.0037 | <0.0037 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.036 | 0.15 | 0.094 | 0.14 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-25D | HS-MW-25D | HS-MW-25D | HS-MW-25S | HS-MW-25S | HS-MW-25S | HS-MW-25S | HS-PMW-26 | HS-PMW-26 | HS-PMW-26 | HS-PMW-26 | HS-PMW-26 | HS-MW-26D | HS-MW-26D | HS-MW-26D | HS-MW-26D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW25D | HS-GW-MW25D | HS-GW-MW-25D | HS-MW-25S | HS-GW-MW25S | HS-GW-MW25S | HS-GW-MW-25S | SB-26 25-30 | SB-26 50-55 | SB-26 60-65 | SB-26 70-75 | SB-26 79-84 | HS-MW-26D | HS-GW-MW26D | HS-GW-MW26D | HS-GW-MW-26D |
| Well Screen Interval (Feet below ground surface) | | | 65.7-70.7 | 65.7-70.7 | 65.7-70.7 | 51.1-56.1 | 51.1-56.1 | 51.1-56.1 | 51.1-56.1 | 25-30 | 50-55 | 60-65 | 70-75 | 79-84 | 79.6-84.6 | 79.6-84.6 | 79.6-84.6 | 79.6-84.6 |
| Laboratory Sample ID | | | UE15023-008 | UI19006-009 | UL05055-004 | UC02020-008 | UE15023-007 | UI19006-012 | UL05055-002 | TK16018-001 | TK16018-003 | TK16018-004 | TK16018-005 | TK16018-006 | UC02020-003 | UE15023-009 | UI12010-013 | UK21036-008 |
| Sample Date | | | 05/14/2019 | 09/17/2019 | 12/02/2019 | 03/01/2019 | 05/14/2019 | 09/17/2019 | 12/02/2019 | 11/12/2018 | 11/14/2018 | 11/14/2018 | 11/14/2018 | 11/14/2018 | 02/28/2019 | 05/15/2019 | 09/11/2019 | 11/19/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0074 | <0.0073 | <0.0077 | <0.0073 | <0.0072 | <0.0076 | <0.0074 | <0.0072 | <0.0071 | <0.007 | <0.0071 | <0.0072 | <0.0074 | <0.0071 | <0.0077 | <0.007 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.012 | 0.011 | 0.018 | 0.017 | 0.01 | 0.0082 | 0.012 | <0.0036 | 0.0059 | 0.0072 | 0.0094 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0074 | <0.0073 | <0.0077 | <0.0073 | <0.0072 | <0.0076 | <0.0074 | <0.0072 | <0.0071 | <0.007 | <0.0071 | <0.0072 | <0.0074 | <0.0071 | <0.0077 | <0.007 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.0069 | 0.007 | 0.0082 | 0.0083 | 0.0045 | 0.0045 | 0.0057 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.0047 | 0.0045 | 0.0054 | 0.0046 | <0.0036 | <0.0038 | 0.0039 | <0.0036 | <0.0035 | <0.0035 | 0.0036 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.0045 | <0.0037 | 0.005 | 0.004 | <0.0036 | <0.0038 | 0.0049 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.01 | 0.0076 | 0.012 | 0.0089 | 0.0056 | 0.0068 | 0.0092 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.014 | 0.01 | 0.015 | 0.012 | 0.0091 | 0.011 | 0.014 | <0.0018 | <0.0018 | 0.0071 | 0.0051 | <0.0018 | 0.0022 | <0.0018 | <0.0019 | <0.0017 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.051*** | ***0.039*** | ***0.042*** | ***0.11*** | ***0.071*** | ***0.057*** | ***0.061*** | <0.0036 | <0.0035 | ***0.028*** | ***0.014*** | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.065 | 0.049 | 0.057 | 0.12 | 0.08 | 0.068 | 0.075 | ND | ND | 0.035 | 0.019 | ND | 0.0022 | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.0086 | 0.0061 | 0.0087 | 0.007 | 0.0043 | 0.0047 | 0.0067 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0038 | <0.0037 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0036 | <0.0038 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | 0.11 | 0.085 | 0.11 | 0.17 | 0.1 | 0.092 | 0.12 | ND | 0.0059 | 0.042 | 0.032 | ND | 0.0022 | ND | ND | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-26M | HS-MW-26M | HS-MW-26M | HS-MW-26M | HS-MW-26S | HS-MW-26S | HS-MW-26S | HS-MW-26S | HS-MW-26S | HS-PMW-27 | HS-PMW-27 | HS-PMW-27 | HS-PMW-27 | HS-PMW-27 | HS-MW-27A | HS-MW-27B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-MW-26M | HS-GW-MW26M | HS-GW-MW26M | HS-GW-MW-26M | HS-MW-26S | HS-GW-MW26S | HS-GW-MW26S | HS-GW-MW26S DUP | HS-GW-MW-26S | HS-MW27 21-25 | HS-MW27 33-37 | HS-MW27 41-45 | HS-MW27-52-56 | HS-MW27-60-64 | HS-GW-MW-27A | HS-GW-MW27B |
| Well Screen Interval (Feet below ground surface) | | | 61.7-66.7 | 61.7-66.7 | 61.7-66.7 | 61.7-66.7 | 25.8-30.8 | 25.8-30.8 | 25.8-30.8 | 25.8-30.8 | 25.8-30.8 | 21-25 | 33-37 | 41-45 | 52-56 | 60-64 | 21.6-26.2 | 35.4-38 |
| Laboratory Sample ID | | | UC02020-002 | UE15023-011 | UI12010-017 | UK21036-005 | UC02020-001 | UE15023-010 | UI12010-015 | UI12010-018 | UK21036-001 | UF19002-001 | UF19002-002 | UF19002-003 | UF19026-001 | UF19026-002 | UK19008-001 | UI12010-002 |
| Sample Date | | | 02/28/2019 | 05/15/2019 | 09/11/2019 | 11/19/2019 | 02/28/2019 | 05/15/2019 | 09/11/2019 | 09/11/2019 | 11/19/2019 | 06/17/2019 | 06/17/2019 | 06/17/2019 | 06/18/2019 | 06/18/2019 | 11/18/2019 | 09/09/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0076 | <0.0074 | <0.0071 | <0.0073 | <0.0073 | <0.0073 | <0.0076 | <0.0073 | <0.0073 | <0.0075 | <0.0069 | <0.0075 | <0.0071 | <0.0082 | <0.0077 | <0.0068 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.0044 | 0.0046 | 0.0049 | 0.0053 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | 0.004 | <0.0034 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0076 | <0.0074 | <0.0071 | <0.0073 | <0.0073 | <0.0073 | <0.0076 | <0.0073 | <0.0073 | <0.0075 | <0.0069 | <0.0075 | <0.0071 | <0.0082 | <0.0077 | <0.0068 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | 0.0056 | <0.0034 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | 0.0079 | <0.0035 | <0.0037 | <0.0036 | 0.012 | 0.0067 | <0.0034 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | 0.0038 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | 0.0069 | <0.0034 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.006 | 0.0055 | 0.0054 | 0.0052 | <0.0018 | <0.0018 | <0.0019 | <0.0018 | <0.0018 | 0.0067 | 0.0032 | <0.0019 | <0.0018 | 0.0025 | 0.0051 | <0.0017 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.014*** | 0.011 | ***0.016*** | ***0.017*** | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | 0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.02 | 0.017 | 0.021 | 0.022 | ND | ND | ND | ND | ND | 0.01 | 0.0032 | ND | ND | 0.0025 | 0.0051 | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | 0.0037 | <0.0035 | <0.0037 | <0.0036 | 0.006 | <0.0038 | <0.0034 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0038 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0037 | <0.0037 | <0.0035 | <0.0037 | <0.0036 | <0.0041 | <0.0038 | <0.0034 |
| Total PFAS (Calculated) | NCL | NCL | 0.024 | 0.021 | 0.026 | 0.028 | ND | ND | ND | ND | ND | 0.026 | 0.0032 | ND | ND | 0.021 | 0.028 | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-27B | HS-MW-27C | HS-MW-27C | HS-MW-27D | HS-MW-27D | HS-MW-27E | HS-MW-27E | HS-PMW-28 | HS-PMW-28 | HS-PMW-28 | HS-PMW-28 | HS-MW-28A | HS-MW-28A | HS-MW-28B | HS-MW-28B | HS-MW-28C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW-27B | HS-GW-MW27C | HS-GW-MW-27C | HS-GW-MW27D | HS-GW-MW-27D | HS-GW-MW27E | HS-GW-MW-27E | HS-MW28 (42-44) | HS-MW28 (51-53) | HS-MW28 (70.5-72.5) | HS-MW28 81-85 | HS-GW-MW28A | HS-GW-MW-28A | HS-GW-MW28B | HS-GW-MW-28B | HS-GW-MW28C |
| Well Screen Interval (Feet below ground surface) | | | 35.4-38 | 41.3-45.9 | 41.3-45.9 | 52.4-56.4 | 52.4-56.4 | 58.5-62.5 | 58.5-62.5 | 42-44 | 51-53 | 70.5-72.5 | 81-85 | 39.1-43.7 | 39.1-43.7 | 43.3-47.9 | 43.3-47.9 | 49.2-53.8 |
| Laboratory Sample ID | | | UK19008-003 | UI12010-001 | UK19008-002 | UI12010-003 | UK21036-002 | UI12010-004 | UK19008-004 | UF07034-001 | UF07034-002 | UF07034-003 | UF12004-001 | UI19006-013 | UK21036-018 | UI19006-005 | UK21036-019 | UI19006-001 |
| Sample Date | | | 11/18/2019 | 09/09/2019 | 11/18/2019 | 09/09/2019 | 11/19/2019 | 09/09/2019 | 11/18/2019 | 06/05/2019 | 06/05/2019 | 06/06/2019 | 06/10/2019 | 09/17/2019 | 11/21/2019 | 09/16/2019 | 11/21/2019 | 09/16/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | 0.011 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0075 | <0.0072 | <0.0075 | <0.0068 | <0.0076 | <0.0073 | <0.0074 | <0.007 | <0.0072 | <0.0069 | <0.007900001 | <0.0072 | <0.0072 | <0.0074 | <0.0075 | <0.0076 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | 0.005 | 0.0065 | <0.0035 | <0.004 | 0.0063 | 0.0047 | 0.0083 | 0.0092 | <0.0038 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0075 | <0.0072 | <0.0075 | <0.0068 | <0.0076 | <0.0073 | <0.0074 | <0.007 | <0.0072 | <0.0069 | <0.007900001 | <0.0072 | <0.0072 | <0.0074 | <0.0075 | <0.0076 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | 0.0039 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | 0.01 | 0.0074 | <0.0035 | 0.0049 | <0.0035 | 0.006 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | 0.0037 | <0.0037 | <0.0035 | 0.0041 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0019 | <0.0018 | <0.0019 | <0.0017 | <0.0019 | 0.0031 | 0.0025 | <0.0017 | 0.0059 | <0.0017 | 0.002 | <0.0018 | <0.0018 | 0.0023 | <0.0019 | <0.0019 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | 0.0057 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | 0.0031 | 0.0025 | ND | 0.012 | ND | 0.002 | ND | ND | 0.0023 | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | 0.0038 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0035 | <0.004 | <0.0036 | <0.0036 | <0.0037 | <0.0038 | <0.0038 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | 0.017 | 0.0099 | 0.005 | 0.035 | ND | 0.008 | 0.0063 | 0.0047 | 0.011 | 0.0092 | 0.011 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-28C | HS-MW-28D | HS-MW-28D | HS-MW-28D | HS-MW-28E | HS-MW-28E | HS-PMW-29 | HS-PMW-29 | HS-PMW-29 | HS-PMW-29 | HS-PMW-29 | HS-MW-29A | HS-MW-29B | HS-MW-29C | HS-MW-29D | HS-PMW-30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW-28C | HS-GW-MW28D | HS-GW-MW-28D | HS-GW-MW-28D DUP | HS-GW-MW28E | HS-GW-MW-28E | HS-GW-MW29 (11-15) | HS-GW-MW29 (21-25) | HS-GW-MW29 (31-35) | HS-GW-MW29 (41-45) | HS-GW-MW29 (46-50) | HS-GW-MW-29A | HS-GW-MW-29B | HS-GW-MW-29C | HS-GW-MW-29D | HS-MW30 (52-54) |
| Well Screen Interval (Feet below ground surface) | | | 49.2-53.8 | 62.2-66.8 | 62.2-66.8 | 62.2-66.8 | 82.7-87.3 | 82.7-87.3 | 11-15 | 21-25 | 31-35 | 41-45 | 46-50 | 3.5-13.5 | 16.8-21.8 | 27.2-32.2 | 37.1-42.1 | 52-54 |
| Laboratory Sample ID | | | UK21036-016 | UI19006-010 | UK21036-014 | UK21036-015 | UI19006-011 | UK21036-017 | UJ08016-001 | UJ08016-002 | UJ08016-003 | UJ08016-004 | UJ08016-005 | UK19008-006 | UK21036-003 | UK21036-004 | UK19008-005 | UE17049-001 |
| Sample Date | | | 11/21/2019 | 09/17/2019 | 11/21/2019 | 11/21/2019 | 09/17/2019 | 11/21/2019 | 10/01/2019 | 10/01/2019 | 10/01/2019 | 10/01/2019 | 10/02/2019 | 11/18/2019 | 11/19/2019 | 11/19/2019 | 11/18/2019 | 05/13/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0071 | <0.007 | <0.0072 | <0.0074 | <0.007 | <0.0072 | <0.0071 | <0.007 | <0.007 | <0.0071 | <0.0073 | <0.007 | <0.0069 | <0.007 | <0.007 | <0.0072 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | 0.015 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | 0.018 | 0.024 | 0.011 | 0.0035 | 0.0067 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | 0.01 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0071 | <0.007 | <0.0072 | <0.0074 | <0.007 | <0.0072 | <0.0071 | <0.007 | <0.007 | <0.0071 | <0.0073 | <0.007 | <0.0069 | <0.007 | <0.007 | <0.0072 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | 0.0056 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | 0.017 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | 0.025 | <0.0034 | <0.0035 | <0.0035 | 0.0044 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | 0.01 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | 0.0064 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | 0.017 | <0.0034 | <0.0035 | <0.0035 | 0.0041 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0018 | <0.0017 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | 0.0091 | <0.0017 | <0.0018 | <0.0018 | <0.0018 | 0.036 | <0.0017 | <0.0018 | <0.0018 | 0.0088 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | ***0.053*** | <0.0035 | <0.0035 | <0.0036 | <0.0036 | ***0.32*** | 0.004 | <0.0035 | <0.0035 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | 0.062 | ND | ND | ND | ND | 0.36 | 0.004 | ND | ND | 0.0088 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | 0.01 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0035 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | 0.094 | ND | ND | ND | ND | 0.46 | 0.028 | 0.011 | 0.0035 | 0.024 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-PMW-30 | HS-PMW-30 | HS-PMW-30 | HS-PMW-30 | HS-PMW-30 | HS-PMW-30 | HS-PMW-30 | HS-MW-30A | HS-MW-30A | HS-MW-30A | HS-MW-30A | HS-MW-30B | HS-MW-30B | HS-MW-30B | HS-MW-30C | HS-MW-30C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-MW30 (61-63) | HS-MW30 (75-77) | HS-MW30 (100-102) | HS-MW30 (111-113) | HS-MW30 (121-123) | HS-MW30 (128-130) | HS-MW30 (138-140) | HS-GW-MW30A | HS-GW-MW30A | HS-GW-MW-30A | HS-GW-MW-30A DUP | HS-GW-MW30B | HS-GW-MW30B | HS-GW-MW-30B | HS-GW-MW30C | HS-GW-MW30C |
| Well Screen Interval (Feet below ground surface) | | | 61-63 | 75-77 | 100-102 | 111-113 | 121-123 | 128-130 | 138-140 | 46.9-51.5 | 46.9-51.5 | 46.9-51.5 | 46.9-51.5 | 51.5-56.1 | 51.5-56.1 | 51.5-56.1 | 77.4-82 | 77.4-82 |
| Laboratory Sample ID | | | UE17049-003 | UE17049-004 | UE17049-005 | UE17049-006 | UE17005-001 | UE17005-002 | UE17005-003 | UG03026-005 | UI19006-014 | UK19008-010 | UK19008-011 | UG03026-007 | UI21016-001 | UK19008-014 | UG06001-001 | UI19006-015 |
| Sample Date | | | 05/14/2019 | 05/14/2019 | 05/14/2019 | 05/14/2019 | 05/15/2019 | 05/15/2019 | 05/15/2019 | 07/02/2019 | 09/17/2019 | 11/20/2019 | 11/20/2019 | 07/02/2019 | 09/19/2019 | 11/20/2019 | 07/03/2019 | 09/17/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.007 | <0.0073 | <0.0071 | <0.0075 | <0.0073 | <0.0071 | <0.0071 | <0.0071 | <0.0069 | <0.0071 | <0.0084 | <0.0072 | <0.0075 | <0.007 | <0.0074 | <0.0069 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0035 | 0.0042 | <0.0035 | 0.004 | <0.0036 | <0.0036 | <0.0036 | 0.0061 | 0.0068 | 0.0072 | 0.0069 | 0.0071 | 0.0074 | 0.0073 | 0.0057 | 0.0055 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.007 | <0.0073 | <0.0071 | <0.0075 | <0.0073 | <0.0071 | <0.0071 | <0.0071 | <0.0069 | <0.0071 | <0.0084 | <0.0072 | <0.0075 | <0.007 | <0.0074 | <0.0069 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | 0.0038 | <0.0035 | <0.0035 | <0.0042 | 0.0038 | <0.0038 | 0.0038 | <0.0037 | <0.0035 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | 0.0043 | 0.01 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | 0.0056 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0017 | <0.0018 | <0.0018 | 0.0026 | 0.0041 | <0.0018 | <0.0018 | 0.0033 | 0.0025 | 0.003 | 0.0027 | 0.0064 | 0.0035 | 0.0041 | <0.0018 | <0.0017 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | 0.0026 | 0.0041 | ND | ND | 0.0033 | 0.0025 | 0.003 | 0.0027 | 0.0064 | 0.0035 | 0.0041 | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | 0.0041 | 0.0066 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0042 | <0.0036 | <0.0038 | <0.0035 | <0.0037 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | ND | 0.0042 | ND | 0.015 | 0.026 | ND | ND | 0.013 | 0.0093 | 0.01 | 0.0096 | 0.017 | 0.011 | 0.015 | 0.0057 | 0.0055 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-30C | HS-MW-30D | HS-MW-30D | HS-MW-30D | HS-MW-30E | HS-MW-30E | HS-MW-30E | HS-PMW-31 | HS-PMW-31 | HS-PMW-31 | HS-PMW-31 | HS-MW-31A | HS-MW-31A | HS-MW-31A | HS-MW-31B | HS-MW-31B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW-30C | HS-GW-MW30D | HS-GW-MW30D | HS-GW-MW-30D | HS-GW-MW30E | HS-GW-MW30E | HS-GW-MW-30E | HS-MW31 (21.22.5) | HS-MW31 (31.0-32.5) | HS-MW31 (41.0-42.5) | HS-MW31 (51.0-52.5) | HS-GW-MW31A | HS-GW-MW31A | HS-GW-MW-31A | HS-GW-MW31B | HS-GW-MW31B |
| Well Screen Interval (Feet below ground surface) | | | 77.4-82 | 112.7-117.3 | 112.7-117.3 | 112.7-117.3 | 123.2-127.7 | 123.2-127.7 | 123.2-127.7 | 21-22.5 | 31-32.5 | 41-42.5 | 51-52.5 | 17.1-21.6 | 17.1-21.6 | 17.1-21.6 | 26-30.5 | 26-30.5 |
| Laboratory Sample ID | | | UK21036-026 | UG03026-008 | UI21016-002 | UK21036-024 | UG03026-006 | UI19006-016 | UK21036-025 | UE17005-006 | UE17005-007 | UE17005-008 | UE17005-009 | UG03026-003 | UI13033-001 | UK21036-006 | UG03026-001 | UI13033-004 |
| Sample Date | | | 11/22/2019 | 07/02/2019 | 09/19/2019 | 11/22/2019 | 07/02/2019 | 09/17/2019 | 11/22/2019 | 05/15/2019 | 05/15/2019 | 05/17/2019 | 05/17/2019 | 07/01/2019 | 09/12/2019 | 11/19/2019 | 07/01/2019 | 09/12/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | 0.0047 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0069 | <0.0071 | <0.007 | <0.0071 | <0.0074 | <0.0069 | <0.0077 | <0.0068 | <0.007 | <0.0072 | <0.0071 | <0.007 | <0.007 | <0.0073 | <0.0073 | <0.0075 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.0055 | 0.0048 | 0.0053 | 0.0056 | 0.0055 | 0.0063 | 0.0059 | <0.0034 | 0.0099 | 0.015 | 0.011 | 0.011 | 0.0055 | 0.0068 | 0.014 | 0.012 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0069 | <0.0071 | <0.007 | <0.0071 | <0.0074 | <0.0069 | <0.0077 | <0.0068 | <0.007 | <0.0072 | <0.0071 | <0.007 | <0.007 | <0.0073 | <0.0073 | <0.0075 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | 0.0055 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | 0.0041 | 0.0049 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | 0.0091 | 0.012 | 0.008 | 0.0071 | 0.0075 | 0.0053 | 0.011 | 0.011 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | 0.0042 | 0.005 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | 0.006 | 0.0042 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | 0.0034 | 0.0039 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | 0.0038 | <0.0037 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | 0.0054 | 0.0059 | 0.007 | 0.0075 | <0.0035 | <0.0035 | 0.0043 | 0.0056 | 0.0082 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0017 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0017 | <0.0019 | 0.0069 | 0.011 | 0.011 | 0.008 | 0.0035 | 0.0038 | 0.0032 | 0.022 | 0.012 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | 0.0055 | 0.0055 | <0.0035 | <0.0035 | <0.0036 | 0.0059 | 0.005 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | 0.0069 | 0.011 | 0.017 | 0.014 | 0.0035 | 0.0038 | 0.0032 | 0.028 | 0.017 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | 0.0067 | 0.0048 | 0.005 | 0.0053 | <0.0035 | <0.0035 | <0.0036 | 0.0051 | 0.0059 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0034 | <0.0036 | <0.0035 | <0.0036 | <0.0037 | <0.0034 | <0.0038 | <0.0034 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0037 |
| Total PFAS (Calculated) | NCL | NCL | 0.0055 | 0.0048 | 0.0053 | 0.0056 | 0.0055 | 0.011 | 0.0059 | 0.022 | 0.049 | 0.066 | 0.045 | 0.022 | 0.017 | 0.02 | 0.078 | 0.063 |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-31B | HS-MW-31C | HS-MW-31C | HS-MW-31C | HS-MW-31D | HS-MW-31D | HS-MW-31D | HS-MW-31E | HS-MW-31E | HS-MW-31E | HS-MW-31E | HS-PMW-32 | HS-PMW-32 | HS-PMW-32 | HS-PMW-32 | HS-PMW-32 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW-31B | HS-GW-MW31C | HS-GW-MW31C | HS-GW-MW-31C | HS-GW-MW31D | HS-GW-MW31D | HS-GW-MW-31D | HS-GW-MW31E | HS-GW-MW31E DUP | HS-GW-MW31E | HS-GW-MW-31E | WV-MW-32 (54-64) | WV-MW-32 (64-74) | WV-MW-32 (102-112) | WV-MW-32 (112-122) | WV-MW-32 (130-140) |
| Well Screen Interval (Feet below ground surface) | | | 26-30.5 | 41.3-45.8 | 41.3-45.8 | 41.3-45.8 | 48.8-53.4 | 48.8-53.4 | 48.8-53.4 | 64.1-68.7 | 64.1-68.7 | 64.1-68.7 | 64.1-68.7 | 54-64 | 64-74 | 102-112 | 112-122 | 130-140 |
| Laboratory Sample ID | | | UK19008-013 | UG03026-004 | UI13033-003 | UK21036-007 | UG03026-002 | UI13033-002 | UK21036-027 | UG06001-002 | UG06001-003 | UI13033-005 | UK19008-009 | UD19022-001 | UD19022-002 | UD19022-003 | UD19022-004 | UD19022-005 |
| Sample Date | | | 11/20/2019 | 07/01/2019 | 09/12/2019 | 11/19/2019 | 07/01/2019 | 09/12/2019 | 11/22/2019 | 07/03/2019 | 07/03/2019 | 09/12/2019 | 11/20/2019 | 04/15/2019 | 04/16/2019 | 04/16/2019 | 04/17/2019 | 04/17/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0073 | <0.0075 | <0.007 | <0.0073 | <0.0072 | <0.0069 | <0.0075 | <0.0075 | <0.0072 | <0.0068 | <0.007 | <0.01 | <0.0084 | <0.0088 | <0.0078 | <0.0078 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.012 | 0.018 | 0.016 | 0.015 | 0.012 | 0.011 | 0.0076 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0073 | <0.0075 | <0.007 | <0.0073 | <0.0072 | <0.0069 | <0.0075 | <0.0075 | <0.0072 | <0.0068 | <0.007 | <0.01 | <0.0084 | <0.0088 | <0.0078 | <0.0078 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.0043 | 0.005 | 0.0052 | 0.0048 | <0.0036 | 0.0035 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.013 | 0.011 | 0.0095 | 0.01 | 0.0082 | 0.0069 | 0.0053 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.0072 | 0.0051 | 0.0048 | 0.0047 | 0.0042 | 0.0035 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | 0.0046 | <0.0039 | <0.0039 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.018 | <0.0037 | <0.0035 | <0.0036 | 0.0037 | 0.0038 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.017 | 0.006 | 0.0063 | 0.0073 | 0.0074 | 0.0064 | 0.0041 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | 0.052 | 0.01 | 0.0086 | 0.0079 | 0.0073 | 0.0075 | 0.0074 | <0.0019 | <0.0018 | <0.0017 | <0.0018 | <0.0026 | <0.0021 | 0.0026 | <0.002 | <0.0019 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.014*** | 0.0077 | 0.0059 | 0.0052 | 0.0044 | 0.0053 | 0.007 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.066 | 0.018 | 0.015 | 0.013 | 0.012 | 0.013 | 0.014 | ND | ND | ND | ND | ND | ND | 0.0026 | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.014 | 0.004 | 0.0045 | 0.0057 | 0.006 | 0.0048 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0037 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0037 | <0.0036 | <0.0034 | <0.0035 | <0.0051 | <0.0042 | <0.0044 | <0.0039 | <0.0039 |
| Total PFAS (Calculated) | NCL | NCL | 0.15 | 0.067 | 0.061 | 0.061 | 0.053 | 0.053 | 0.031 | ND | ND | ND | ND | ND | ND | 0.0072 | ND | ND |

**TABLE 3**
GROUNDWATER ANALYTICAL DATA - PFAS
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | HS-MW-32A | HS-MW-32A | HS-MW-32A | HS-MW-32B | HS-MW-32B | HS-MW-32B | HS-MW-32C | HS-MW-32C | HS-MW-32C | HS-MW-32D | HS-MW-32D | HS-MW-32D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | HS-GW-MW32A | HS-GW-MW32A | HS-GW-MW-32A | HS-GW-MW32B | HS-GW-MW32B | HS-GW-MW-32B | HS-GW-MW32C | HS-GW-MW32C | HS-GW-MW-32C | HS-GW-MW32D | HS-GW-MW32D | HS-GW-MW-32D |
| Well Screen Interval (Feet below ground surface) | | | 60.9-65.5 | 60.9-65.5 | 60.9-65.5 | 79.1-83.7 | 79.1-83.7 | 79.1-83.7 | 108.8-113.4 | 108.8-113.4 | 108.8-113.4 | 142.3-146.9 | 142.3-146.9 | 142.3-146.9 |
| Laboratory Sample ID | | | UE25011-005 | UI07020-001 | UK29008-003 | UE25011-006 | UI07020-003 | UK29008-004 | UE25011-007 | UI07020-002 | UK29008-005 | UE25011-008 | UI07020-004 | UK29008-006 |
| Sample Date | | | 05/24/2019 | 09/06/2019 | 11/26/2019 | 05/24/2019 | 09/06/2019 | 11/26/2019 | 05/24/2019 | 09/06/2019 | 11/26/2019 | 05/24/2019 | 09/06/2019 | 11/26/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0073 | <0.0074 | <0.0068 | <0.0074 | <0.0069 | <0.0069 | <0.0076 | <0.0071 | <0.0074 | <0.0074 | <0.0069 | <0.0071 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0073 | <0.0074 | <0.0068 | <0.0074 | <0.0069 | <0.0069 | <0.0076 | <0.0071 | <0.0074 | <0.0074 | <0.0069 | <0.0071 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | 0.0044 | <0.0035 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| ***Perfluorooctanoic acid (PFOA)*** | 8.0 (A) | 12 | <0.0018 | <0.0019 | <0.0017 | <0.0018 | <0.0017 | <0.0017 | <0.0019 | <0.0018 | <0.0019 | <0.0018 | <0.0017 | <0.0018 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0037 | <0.0034 | <0.0037 | <0.0035 | <0.0035 | <0.0038 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0044 | ND |

**TABLE 3 NOTES**
House Street Disposal Site Study Area
Plainfield Township, Kent County, MI

**NOTES:**

1. Concentration and criteria units are micrograms per Liter (µg/L) or parts per billion (ppb). Calculated criteria and concentrations are rounded to two significant digits. "ND" indicates the parameters used in the calculation were not detected.
2. Michigan Part 201 Groundwater Cleanup Criteria are based on "Table 1, Groundwater: Residential and Nonresidential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Tier I Risk Based Screening Levels," Michigan Administrative Code, Cleanup Criteria Requirements for Response Activity, Rules 299.44 and 299.49, effective December 30, 2013; updated August 3, 2020.
   Abbreviations Include:
   "NCL" indicates no criterion listed in EGLE Table 1.
   Footnotes Include:
   (A) - The criterion is the State of Michigan drinking water standard.
3. Bold, italic number with thick line border or italic parameter name indicates that parameter was detected above the Michigan Part 201 Groundwater Cleanup Criteria listed.
4. Abbreviations include:
   "< RL" indicates the parameter was analyzed for but not detected above the method detection limit; RL = Reporting Limit.
   "DUP" indicates a duplicate sample.
   "-" indicates the paramater was not analyzed.
   "J" indicates the result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
   "UJ" indicates the analyte was analyzed for but was not detected. The reported quantitation limit is approximate.
5. Well screen interval presented is the top of the well screen to the bottom of the well screen in feet below ground surface.

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-1 | WV-MW-1 | WV-MW-1 | WV-MW-1 | WV-MW-1 | WV-PMW-2 | WV-PMW-2 | WV-MW-2D | WV-MW-2D | WV-MW-2D | WV-MW-2D | WV-MW-2D | WV-MW-2S | WV-MW-2S | WV-MW-2S | WV-MW-2S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | PMW-WV-1 | MW-WV-1 | WV-GW-MW1 | WV-GW-MW1 | WV-GW-MW-1 | PMW-WV-2 (13-18) | PMV-WV 2 31 - 36 | PMW-WV-2D | MW-WV-2D | WV-GW-MW2D | WV-GW-MW2D | WV-GW-MW-2D | PMW-WV-2S | MW-WV-2S | WV-GW-MW2S | WV-GW-MW2S |
| Well Screen Interval (Feet below ground surface) | | | 137.8-142.8 | 137.8-142.8 | 137.8-142.8 | 137.8-142.8 | 137.8-142.8 | 13-18 | 31-36 | 30.2-35.2 | 30.2-35.2 | 30.2-35.2 | 30.2-35.2 | 30.2-35.2 | 20.2-25.2 | 20.2-25.2 | 20.2-25.2 | 20.2-25.2 |
| Laboratory Sample ID | | | TC30012-002 | UB20051-010 | UE09028-012 | UI05007-008 | UK13023-002 | K1801515-002 | K1801591-001 | TC30012-006 | UB20051-002 | UE09028-013 | UI05007-005 | UK07051-005 | TC30012-010 | UB20051-001 | UE09028-014 | UI05007-004 |
| Sample Date | | | 03/28/2018 | 02/20/2019 | 05/10/2019 | 09/04/2019 | 11/12/2019 | 02/14/2018 | 02/16/2018 | 03/29/2018 | 02/18/2019 | 05/10/2019 | 09/03/2019 | 11/05/2019 | 03/29/2018 | 02/18/2019 | 05/10/2019 | 09/03/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.007 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0072 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0074 | <0.0036 | <0.0037 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.007 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0072 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0074 | <0.0036 | <0.0037 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.007 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0072 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0074 | <0.0036 | <0.0037 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | <0.0047 | <0.0051 | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.014 | <0.007 | <0.0071 | <0.0067 | <0.007 | <0.0047 | <0.0051 | <0.014 | <0.0071 | <0.0072 | <0.0072 | <0.0077 | <0.015 | <0.0071 | <0.0073 | <0.0071 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | <0.0047 | <0.0051 | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.046 | 0.032 | 0.0072 | 0.048 | 0.041 | 0.02 | 0.05 | 0.056 | 0.051 | 0.046 | 0.045 | 0.042 | 0.017 | 0.014 | 0.013 | 0.016 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | 0.23 | 0.17 | 0.071 | 0.25 | 0.22 | 0.13 | 0.024 | 0.015 | 0.016 | 0.016 | 0.022 | 0.016 | 0.074 | 0.062 | 0.047 | 0.054 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.007 | <0.007 | <0.0071 | <0.0067 | <0.007 | - | - | <0.0072 | <0.0071 | <0.0072 | <0.0072 | <0.0077 | <0.0074 | <0.0071 | <0.0073 | <0.0071 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.007 | <0.0035 | 0.0099 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0072 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0074 | <0.0036 | <0.0037 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.14 | 0.1 | 0.022 | 0.14 | 0.12 | - | - | 0.14 | 0.14 | 0.12 | 0.13 | 0.13 | 0.018 | 0.015 | 0.016 | 0.02 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 1.1 | 0.81 | 0.18 | 1.1 | 0.77 | 0.086 | 0.24 | 0.35 | 0.32 | 0.28 | 0.26 | 0.28 | 0.08 | 0.065 | 0.052 | 0.065 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.031 | 0.022 | 0.0059 | 0.037 | 0.029 | <0.0094 | 0.02 | 0.026 | 0.022 | 0.02 | 0.017 | 0.019 | 0.011 | 0.0081 | 0.0074 | 0.0096 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.25 | 0.17 | 0.035 | 0.26 | 0.22 | 0.035 | 0.15 | 0.15 | 0.14 | 0.13 | 0.12 | 0.12 | 0.033 | 0.024 | 0.022 | 0.032 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.1 | 0.065 | 0.014 | 0.11 | 0.095 | 0.023 | 0.061 | 0.081 | 0.068 | 0.061 | 0.055 | 0.057 | 0.023 | 0.016 | 0.015 | 0.017 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | 0.015 | 0.01 | 0.0049 | 0.017 | 0.013 | 0.0057 | <0.0051 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | 0.0058 | 0.0059 | 0.006 | 0.0071 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 3.3 | 2.8 | 0.57 | 4.3 | 2.9 | 0.28 | 0.72 | 0.97 | 1.1 | 1 | 0.89 | 0.92 | 0.32 | 0.29 | 0.27 | 0.32 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***7.3*** | ***6.1*** | ***3.7*** | ***10*** | ***6.7*** | ***2.7*** | ***0.096*** | ***0.064*** | ***0.064*** | ***0.077*** | ***0.15*** | ***0.11*** | ***3.2*** | ***3.8*** | ***3.4*** | ***3.8*** |
| PFOA + PFOS (Calculated) | NCL | NCL | 11 | 8.9 | 4.3 | 14 | 9.6 | 3 | 0.82 | 1 | 1.2 | 1.1 | 1 | 1 | 3.5 | 4.1 | 3.7 | 4.1 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.039 | 0.025 | 0.0057 | 0.037 | 0.036 | 0.014 | 0.025 | 0.033 | 0.027 | 0.026 | 0.025 | 0.026 | 0.014 | 0.0093 | 0.0083 | 0.0089 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.007 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0072 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0074 | <0.0036 | <0.0037 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0035 | <0.0036 | <0.0034 | <0.0035 | <0.0047 | <0.0051 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 13 | 10.3 | 4.6 | 16 | 11 | 3.3 | 1.4 | 1.9 | 1.9 | 1.8 | 1.7 | 1.7 | 3.8 | 4.3 | 3.9 | 4.3 |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-2S | WV-PMW-3 | WV-PMW-3 | WV-PMW-3 | WV-PMW-3 | WV-PMW-3 | WV-MW-3D | WV-MW-3D | WV-MW-3D | WV-MW-3D | WV-MW-3D | WV-MW-3D | WV-MW-3S | WV-MW-3S | WV-MW-3S | WV-MW-3S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | WV-GW-MW-2S | PMW-WV-3 5-10 | PMW-WV-3 13-18 | PMW_WV3-3439 | PMW_WV3-4449 | PMW_WV3-5459 | DUP-1 | PMW-WV-3D | MW-WV-3D | WV-GW-MW3D | WV-GW-MW3D | WV-GW-MW-3D | PMW-WV-3S | MW-WV-3S | WV-GW-MW3S | WV-GW-MW3S |
| Well Screen Interval (Feet below ground surface) | | | 20.2-25.2 | 5-10 | 13-18 | 34-39 | 44-49 | 54-59 | 57.5-62.5 | 57.5-62.5 | 57.5-62.5 | 57.5-62.5 | 57.5-62.5 | 57.5-62.5 | 5.1-10.1 | 5.1-10.1 | 5.1-10.1 | 5.1-10.1 |
| Laboratory Sample ID | | | UK07051-004 | K1801320-001 | K1801320-002 | K1801365-002 | K1801365-004 | K1801365-005 | TC30012-011 | TC30012-008 | UB16022-008 | UE09028-018 | UI05007-010 | UK07025-005 | TC30012-009 | UB16022-007 | UE09028-022 | UI05007-011 |
| Sample Date | | | 11/05/2019 | 02/08/2018 | 02/08/2018 | 02/12/2018 | 02/12/2018 | 02/12/2018 | 03/29/2018 | 03/29/2018 | 02/15/2019 | 05/09/2019 | 09/04/2019 | 11/06/2019 | 03/29/2018 | 02/15/2019 | 05/09/2019 | 09/04/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0075 | <0.0075 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.007 | <0.0037 | <0.0037 | <0.0035 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0075 | <0.0075 | <0.0038 | <0.0037 | <0.0037 | 0.0049 | <0.007 | <0.0037 | <0.0037 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0075 | <0.0075 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.007 | <0.0037 | <0.0037 | <0.0035 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0073 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.015 | <0.015 | <0.0076 | <0.0074 | <0.0073 | <0.0078 | <0.014 | <0.0075 | <0.0074 | <0.0071 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.013 | 0.0049 | 0.012 | <0.0044 | 0.0052 | 0.0053 | 0.0066 | 0.0064 | 0.006 | 0.0051 | 0.006 | 0.0054 | 0.0049 | 0.006 | 0.0068 | 0.0082 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.0035 | <0.0037 | <0.0037 | <0.0035 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | 0.049 | 0.021 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | 0.0092 | 0.0044 | <0.0037 | 0.0041 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0073 | - | - | - | - | - | <0.0075 | <0.0075 | <0.0076 | <0.0074 | <0.0073 | <0.0078 | <0.007 | <0.0075 | <0.0074 | <0.0071 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0075 | <0.0075 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.007 | <0.0037 | <0.0037 | <0.0035 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.017 | - | - | - | - | - | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | 0.005 | 0.0052 | 0.0053 | 0.0074 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.061 | 0.045 | 0.11 | 0.024 | <0.0044 | 0.0061 | 0.0047 | 0.0042 | 0.004 | <0.0037 | 0.004 | 0.0039 | 0.023 | 0.018 | 0.014 | 0.024 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.0081 | 0.009 | <0.0085 | <0.0089 | <0.0089 | <0.0087 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | 0.0053 | 0.008 | 0.0081 | 0.0097 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.0035 | <0.0037 | <0.0037 | <0.0035 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.0035 | <0.0037 | <0.0037 | <0.0035 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.023 | 0.029 | 0.06 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | 0.011 | 0.0097 | 0.009 | 0.014 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.013 | 0.013 | 0.024 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | 0.0061 | 0.007 | 0.008 | 0.0083 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | 0.0059 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.0035 | <0.0037 | <0.0037 | <0.0035 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 0.27 | 0.19 | 0.13 | 0.028 | <0.0018 | <0.0017 | <0.0038 | <0.0037 | <0.0019 | <0.0018 | 0.0019 | <0.0019 | 0.093 | 0.082 | 0.063 | 0.099 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***3.1*** | ***0.34*** | <0.0042 | ***0.028*** | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | ***0.23*** | ***0.15*** | ***0.11*** | ***0.15*** |
| PFOA + PFOS (Calculated) | NCL | NCL | 3.4 | 0.53 | 0.13 | 0.056 | ND | ND | ND | ND | ND | ND | 0.0019 | ND | 0.32 | 0.23 | 0.17 | 0.25 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.0079 | 0.0059 | 0.0051 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.0035 | <0.0037 | <0.0037 | 0.0049 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0075 | <0.0075 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.007 | <0.0037 | <0.0037 | <0.0035 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.0035 | <0.0037 | <0.0037 | <0.0035 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0042 | <0.0042 | <0.0044 | <0.0044 | <0.0044 | <0.0038 | <0.0037 | <0.0038 | <0.0037 | <0.0037 | <0.0039 | <0.0035 | <0.0037 | <0.0037 | <0.0035 |
| Total PFAS (Calculated) | NCL | NCL | 3.6 | 0.7 | 0.34 | 0.08 | 0.0052 | 0.011 | 0.011 | 0.011 | 0.01 | 0.0051 | 0.012 | 0.014 | 0.39 | 0.29 | 0.22 | 0.33 |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-3S | WV-PMW-4 | WV-PMW-4 | WV-MW-4 | WV-MW-4 | WV-MW-4 | WV-MW-4 | WV-MW-4 | WV-PMW-5 | WV-MW-5D | WV-MW-5D | WV-MW-5D | WV-MW-5D | WV-MW-5D | WV-MW-5D | WV-MW-5S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | WV-GW-MW-3S | PMW-WV-4-123 | PMW-WV-4-125-130 | PMW-WV-4 | MW-WV-4 | WV-GW-MW4 | WV-GW-MW4 | WV-GW-MW-4 | PMW-WV5 | PMW-WV-5D | MW-WV-5D | MW-WV-5D DUP | WV-GW-MW5D | WV-GW-MW5D | WV-GW-MW-5D | PMW-WV-5S |
| Well Screen Interval (Feet below ground surface) | | | 5.1-10.1 | 118-123 | 125-130 | 130.2-135.2 | 130.2-135.2 | 130.2-135.2 | 130.2-135.2 | 130.2-135.2 | - | 68.7-73.7 | 68.7-73.7 | 68.7-73.7 | 68.7-73.7 | 68.7-73.7 | 68.7-73.7 | 61.5-66.5 |
| Laboratory Sample ID | | | UK07025-004 | K1802438-001 | K1802438-002 | TE25018-002 | UB20051-013 | UE16022-001 | UI05007-002 | UK19013-002 | K1802089-001 | TC30012-004 | UB16022-003 | UB16022-005 | UE09028-017 | UI05007-001 | UK19013-003 | TC30012-003 |
| Sample Date | | | 11/06/2019 | 03/14/2018 | 03/14/2018 | 05/23/2018 | 02/21/2019 | 05/13/2019 | 09/03/2019 | 11/13/2019 | 03/06/2018 | 03/28/2018 | 02/14/2019 | 02/14/2019 | 05/09/2019 | 09/03/2019 | 11/13/2019 | 03/28/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0072 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0071 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0072 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0071 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0072 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0071 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | <0.0051 | <0.0046 | - | - | - | - | - | <0.0048 | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0075 | <0.0051 | <0.0046 | <0.007 | <0.007 | <0.0071 | <0.0069 | <0.0074 | <0.0048 | <0.014 | <0.0073 | <0.0076 | <0.007 | <0.0069 | <0.0072 | <0.014 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | <0.0051 | <0.0046 | - | - | - | - | - | <0.0048 | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.0074 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | 0.008 | 0.0083 | 0.0077 | 0.0074 | 0.0074 | 0.0086 | 0.009 | 0.006 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0075 | - | - | <0.007 | <0.007 | <0.0071 | <0.0069 | <0.0074 | - | <0.0072 | <0.0073 | <0.0076 | <0.007 | <0.0069 | <0.0072 | <0.0071 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0072 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0071 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.0054 | - | - | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | - | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.015 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | 0.0069 | <0.0036 | <0.0037 | 0.0038 | 0.0039 | 0.0037 | 0.0036 | <0.0036 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.0085 | 0.016 | <0.0093 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0096 | <0.0036 | <0.0037 | <0.0038 | 0.005 | 0.0041 | <0.0036 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.0089 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.0063 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | 0.0051 | 0.0046 | <0.0036 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 0.06 | 0.0044 | <0.0019 | <0.0017 | <0.0017 | <0.0018 | <0.0017 | <0.0019 | 0.0043 | <0.0036 | 0.0027 | 0.0027 | 0.0055 | 0.0082 | 0.0061 | <0.0036 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.095*** | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.16 | 0.0044 | ND | ND | ND | ND | ND | ND | 0.0043 | ND | 0.0027 | 0.0027 | 0.0055 | 0.0082 | 0.0061 | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0072 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0071 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0037 | <0.0051 | <0.0046 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0048 | <0.0036 | <0.0037 | <0.0038 | <0.0035 | <0.0034 | <0.0036 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.21 | 0.0 | ND | ND | ND | ND | ND | ND | 0.019 | 0.0083 | 0.01 | 0.014 | 0.022 | 0.03 | 0.023 | 0.006 |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-5S | WV-MW-5S | WV-MW-5S | WV-MW-5S | WV-PMW-6 | WV-PMW-6 | WV-MW-6D | WV-MW-6D | WV-MW-6D | WV-MW-6D | WV-MW-6D | WV-MW-6S | WV-MW-6S | WV-MW-6S | WV-MW-6S | WV-MW-6S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | MW-WV-5S | WV-GW-MW5S | WV-GW-MW5S | WV-GW-MW-5S | PMW-WV-6 13-18 | PMWWV6-03-21-18 (98-103) | MW-6D | MW-WV-6D | WV-GW-MW6D | WV-GW-MW6D | VW-GW-MW-6D | MW-6S | MW-WV-6S | WV-GW-MW6S | WV-GW-MW6S | VW-GW-MW-6S |
| Well Screen Interval (Feet below ground surface) | | | 61.5-66.5 | 61.5-66.5 | 61.5-66.5 | 61.5-66.5 | 13-18 | 98-103 | 99.1-104.1 | 99.1-104.1 | 99.1-104.1 | 99.1-104.1 | 99.1-104.1 | 13.3-18.3 | 13.3-18.3 | 13.3-18.3 | 13.3-18.3 | 13.3-18.3 |
| Laboratory Sample ID | | | UB16022-004 | UE09028-016 | UI05007-003 | UK19013-004 | K1802550-001 | K1802656-003 | TD12014-001 | UB20051-005 | UE02030-010 | UH29005-021 | UK09009-004 | TD12014-003 | UB20051-004 | UE02030-011 | UH29005-020 | UK09009-003 |
| Sample Date | | | 02/14/2019 | 05/09/2019 | 09/03/2019 | 11/13/2019 | 03/19/2018 | 03/21/2018 | 04/11/2018 | 02/19/2019 | 05/02/2019 | 08/28/2019 | 11/08/2019 | 04/11/2018 | 02/19/2019 | 05/02/2019 | 08/28/2019 | 11/08/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0075 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0073 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0075 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0073 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0075 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0073 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | <0.0049 | <0.0048 | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0073 | <0.0072 | <0.007 | <0.0077 | <0.0049 | <0.0048 | <0.015 | <0.0072 | <0.0072 | <0.0067 | <0.0072 | <0.015 | <0.0071 | <0.0071 | <0.0069 | <0.0072 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | <0.0049 | <0.0048 | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.0088 | 0.0075 | 0.0087 | 0.0074 | 0.0083 | 0.017 | 0.018 | 0.016 | 0.016 | 0.017 | 0.017 | 0.0078 | 0.0076 | 0.0082 | 0.0086 | 0.0093 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0073 | <0.0072 | <0.007 | <0.0077 | - | - | <0.0075 | <0.0072 | <0.0072 | <0.0067 | <0.0072 | <0.0073 | <0.0071 | <0.0071 | <0.0069 | <0.0072 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0075 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0073 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | - | - | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0037 | <0.0036 | 0.004 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | 0.0039 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0098 | <0.0096 | 0.005 | 0.0047 | 0.0049 | 0.0055 | 0.0053 | <0.0036 | 0.0072 | 0.0056 | 0.0036 | 0.0098 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | 0.0039 | <0.0036 | <0.0034 | 0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.004 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | 0.0063 | <0.0036 | <0.0034 | 0.0066 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 0.005 | 0.0047 | 0.0061 | 0.0026 | 0.009 | 0.0029 | <0.0038 | 0.0027 | 0.0027 | 0.0034 | 0.0035 | 0.0069 | 0.019 | 0.013 | 0.0066 | 0.024 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0037 | <0.0036 | <0.0035 | <0.0038 | 0.0058 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | 0.0048 | 0.0044 | 0.0046 | 0.0066 | 0.0089 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.005 | 0.0047 | 0.0061 | 0.0026 | 0.015 | 0.0029 | ND | 0.0027 | 0.0027 | 0.0034 | 0.0035 | 0.012 | 0.023 | 0.018 | 0.013 | 0.033 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0075 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0073 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0037 | <0.0036 | <0.0035 | <0.0038 | <0.0049 | <0.0048 | <0.0038 | <0.0036 | <0.0036 | <0.0033 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0034 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.018 | 0.012 | 0.019 | 0.01 | 0.023 | 0.02 | 0.023 | 0.023 | 0.024 | 0.026 | 0.026 | 0.02 | 0.048 | 0.031 | 0.025 | 0.066 |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-PMW-7 | WV-PMW-7 | WV-PMW-7 | WV-PMW-7 | WV-PMW-7 | WV-PMW-7 | WV-PMW-7 | WV-PMW-7 | WV-MW-7D | WV-MW-7D | WV-MW-7D | WV-MW-7D | WV-MW-7M | WV-MW-7M | WV-MW-7M | WV-MW-7S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | PMW-WV-7 20-25 | PMW-WV-7 29.5-34.5 | PMW-WV-7 40-45 | PMW-WV-7 50-55 | PMW-WV-7-7 60-65 | PMW-WV-7-7 70-75 | PMW-WV-7-7 80-85 | PMW-WV-7-7 88.5-93.5 | MW-WV-7D | WV-GW-MW7D | WV-GW-MW 7D | WV-GW-MW-7D | WV-GW-MW7M | WV-GW-MW 7M | WV-GW-MW-7M | MW-WV-7S |
| Well Screen Interval (Feet below ground surface) | | | 20-25 | 29.5-34.5 | 40-45 | 50-55 | 60-65 | 70-75 | 80-85 | 88.5-93.5 | 89.5-94.5 | 89.5-94.5 | 89.5-94.5 | 89.5-94.5 | 49.9-54.9 | 49.9-54.9 | 49.9-54.9 | 16.1-21.1 |
| Laboratory Sample ID | | | TJ26001-001 | TJ26001-002 | TJ26001-003 | TJ26001-004 | TJ26001-007 | TJ26001-008 | TJ26001-009 | TJ26001-010 | UB14084-007 | UE02030-009 | UH29005-001 | UK07051-003 | UE02030-008 | UH29005-003 | UK07051-002 | UB14084-005 |
| Sample Date | | | 10/23/2018 | 10/23/2018 | 10/23/2018 | 10/23/2018 | 10/24/2018 | 10/24/2018 | 10/24/2018 | 10/24/2018 | 02/13/2019 | 05/03/2019 | 08/26/2019 | 11/05/2019 | 05/03/2019 | 08/26/2019 | 11/05/2019 | 02/13/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0072 | <0.0072 | <0.0071 | <0.0071 | <0.0071 | <0.0073 | <0.0071 | <0.0071 | <0.0077 | <0.0072 | <0.0071 | <0.0078 | <0.0072 | <0.007 | <0.0076 | <0.0078 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.0051 | 0.0064 | 0.0073 | 0.011 | 0.0066 | 0.0073 | 0.0095 | 0.0076 | 0.012 | 0.01 | 0.011 | 0.0097 | 0.0083 | 0.01 | 0.0091 | 0.0039 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | 0.011 | 0.0092 | 0.012 | 0.009 | 0.0081 | 0.013 | 0.0053 | 0.013 | 0.013 | 0.013 | 0.012 | 0.01 | 0.011 | 0.0097 | <0.0039 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0072 | <0.0072 | <0.0071 | <0.0071 | <0.0071 | <0.0073 | <0.0071 | <0.0071 | <0.0077 | <0.0072 | <0.0071 | <0.0078 | <0.0072 | <0.007 | <0.0076 | <0.0078 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | 0.0042 | 0.0042 | 0.006 | 0.0037 | 0.0039 | 0.0054 | 0.0068 | 0.0092 | 0.0078 | 0.0069 | 0.0077 | 0.0046 | 0.0053 | 0.0053 | <0.0039 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.0058 | 0.025 | 0.02 | 0.028 | 0.018 | 0.018 | 0.028 | 0.023 | 0.041 | 0.035 | 0.034 | 0.033 | 0.024 | 0.022 | 0.024 | 0.0044 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | 0.0036 | <0.0035 | 0.0044 | 0.0039 | 0.0039 | 0.0047 | 0.0042 | 0.0056 | 0.0054 | 0.0055 | 0.0052 | 0.004 | 0.0043 | 0.0042 | 0.0047 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | 0.0075 | 0.006 | 0.009 | 0.0064 | 0.0065 | 0.0092 | 0.0087 | 0.012 | 0.012 | 0.011 | 0.01 | 0.0073 | 0.0078 | 0.0074 | <0.0039 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0036 | 0.0073 | 0.0064 | 0.0088 | 0.0062 | 0.0075 | 0.0099 | 0.0074 | 0.011 | 0.0097 | 0.0095 | 0.0081 | 0.0066 | 0.0061 | 0.0059 | 0.011 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 0.015 | 0.063 | 0.052 | 0.075 | 0.051 | 0.055 | 0.077 | 0.063 | 0.11 | 0.1 | 0.12 | 0.095 | 0.067 | 0.077 | 0.076 | 0.011 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | ***0.018*** | ***0.23*** | ***0.23*** | ***0.32*** | ***0.27*** | ***0.26*** | ***0.31*** | ***0.06*** | ***0.14*** | ***0.16*** | ***0.2*** | ***0.17*** | ***0.27*** | ***0.28*** | ***0.3*** | <0.0039 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.033 | 0.29 | 0.28 | 0.4 | 0.32 | 0.32 | 0.39 | 0.12 | 0.25 | 0.26 | 0.32 | 0.27 | 0.34 | 0.36 | 0.38 | 0.011 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | 0.0039 | 0.0043 | 0.0045 | 0.0056 | 0.0035 | 0.0049 | 0.0052 | 0.005 | 0.0046 | 0.0038 | 0.0039 | <0.0038 | 0.0091 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0038 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0035 | <0.0038 | <0.0039 |
| Total PFAS (Calculated) | NCL | NCL | 0.044 | 0.4 | 0.34 | 0.48 | 0.38 | 0.37 | 0.47 | 0.19 | 0.36 | 0.36 | 0.42 | 0.36 | 0.41 | 0.43 | 0.44 | 0.044 |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-7S | WV-MW-7S | WV-MW-7S | WV-PMW-8 | WV-PMW-8 | WV-PMW-8 | WV-PMW-8 | WV-PMW-8 | WV-PMW-8 | WV-MW-8D | WV-MW-8D | WV-MW-8D | WV-MW-8D | WV-MW-8M | WV-MW-8M | WV-MW-8M |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | WV-GW-MW7S | WV-GW-MW 7S | WV-GW-MW-7S | WV-8 30-35 | WV-8 40-45 | WV-8 50-55 | WV-8 60-65 | PMW-WV-8-109-114 | PMW-WV-8-119-124 | MW-WW-8D | MW-WV-8D | WV-GW-MW 8D | VW-GW-MW-8D | MW-WW-8M | MW-WV-8M | WV-GW-MW8M |
| Well Screen Interval (Feet below ground surface) | | | 16.1-21.1 | 16.1-21.1 | 16.1-21.1 | 30-35 | 40-45 | 50-55 | 60-65 | 109-114 | 119-124 | 117.2-122.2 | 117.2-122.2 | 117.2-122.2 | 117.2-122.2 | 60-65 | 60-65 | 60-65 |
| Laboratory Sample ID | | | UE02030-007 | UH29005-002 | UK07051-001 | TE03004-001 | TE03004-002 | TE03004-003 | TE03004-004 | TE09005-001 | TE09005-002 | TG07028-003 | UB16022-009 | UH29005-004 | UK09009-001 | TG07028-002 | UB14084-002 | UE02030-003 |
| Sample Date | | | 05/03/2019 | 08/26/2019 | 11/05/2019 | 05/01/2018 | 05/01/2018 | 05/01/2018 | 05/01/2018 | 05/08/2018 | 05/08/2018 | 07/05/2018 | 02/15/2019 | 08/26/2019 | 11/08/2019 | 07/05/2018 | 02/12/2019 | 05/01/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0071 | <0.0068 | <0.0078 | <0.0071 | <0.0069 | <0.0069 | <0.0072 | <0.007 | <0.007 | <0.0069 | <0.007 | <0.0069 | <0.0075 | <0.007 | <0.0075 | <0.0072 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | 0.016 | 0.023 | 0.054 | 0.025 | <0.0035 | 0.0038 | <0.0035 | <0.0035 | 0.0034 | <0.0037 | 0.073 | 0.083 | 0.081 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | 0.0039 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0071 | <0.0068 | <0.0078 | <0.0071 | <0.0069 | <0.0069 | <0.0072 | <0.007 | <0.007 | <0.0069 | <0.007 | <0.0069 | <0.0075 | <0.007 | <0.0075 | <0.0072 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | 0.0043 | 0.0051 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0035 | 0.0065 | <0.0039 | 0.021 | 0.02 | 0.011 | 0.012 | 0.0047 | 0.0041 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | 0.01 | 0.012 | 0.01 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0035 | 0.028 | 0.0053 | 0.0065 | 0.0058 | 0.0077 | 0.0056 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | 0.0085 | 0.0097 | 0.01 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0035 | 0.016 | 0.0054 | 0.0092 | 0.0069 | 0.0049 | 0.0043 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | 0.0042 | 0.0052 | 0.0046 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0035 | 0.028 | 0.0079 | 0.012 | 0.011 | 0.0096 | 0.0067 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | 0.0087 | 0.011 | 0.011 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 0.011 | 0.026 | 0.011 | 0.085 | 0.06 | 0.031 | 0.037 | 0.011 | 0.0059 | 0.0048 | 0.0048 | 0.0052 | 0.0057 | 0.028 | 0.03 | 0.03 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | 0.0036 | <0.0034 | <0.0039 | ***0.039*** | 0.0065 | 0.0061 | 0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | 0.0045 | 0.0065 | 0.005 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.015 | 0.026 | 0.011 | 0.12 | 0.067 | 0.037 | 0.041 | 0.011 | 0.0059 | 0.0048 | 0.0048 | 0.0052 | 0.0057 | 0.033 | 0.037 | 0.035 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0035 | 0.031 | 0.0069 | 0.0068 | 0.0074 | 0.0074 | 0.0047 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | 0.0081 | 0.0093 | 0.0086 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0035 | <0.0034 | <0.0039 | <0.0035 | <0.0035 | <0.0035 | <0.0036 | <0.0035 | <0.0035 | <0.0035 | <0.0035 | <0.0034 | <0.0037 | <0.0035 | <0.0038 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.015 | 0.1 | 0.037 | 0.2 | 0.15 | 0.13 | 0.099 | 0.016 | 0.014 | 0.0048 | 0.0048 | 0.0086 | 0.0057 | 0.15 | 0.17 | 0.16 |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-8M | WV-MW-8M | WV-MW-8S | WV-MW-8S | WV-MW-8S | WV-MW-8S | WV-MW-8S | WV-MW-8S | WV-PMW-9 | WV-PMW-9 | WV-MW-9 | WV-MW-9 | WV-MW-9 | WV-MW-9 | WV-MW-9 | WV-PMW-10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | WV-GW-MW 8M | WV-GW-MW-8M | MW-WW-8S | MW-WV-8S | WV-GW-MW8S | WV-GW-MW8SDUP | WV-GW-MW 8S | WV-GW-MW-8S | PMW-WV-9 79-84 | PMW-WV-9 89-94 | MW-WW-9 | MW-WV-9 | WV-GW-MW9 | WV-GW-MW9 | WV-GW-MW9 | WV-MW-10 (8-18) |
| Well Screen Interval (Feet below ground surface) | | | 60-65 | 60-65 | 30-35 | 30-35 | 30-35 | 30-35 | 30-35 | 30-35 | 79-84 | 89-94 | 92.3-97.3 | 92.3-97.3 | 92.3-97.3 | 92.3-97.3 | 92.3-97.3 | 8-18 |
| Laboratory Sample ID | | | UH29005-005 | UK07025-007 | TG07028-001 | UB14084-001 | UE02030-004 | UE02030-005 | UH29005-006 | UK07025-006 | TE12011-001 | TE12011-002 | TG07028-004 | UB20051-012 | UE09028-015 | UI05007-009 | UK13023-011 | UB28083-001 |
| Sample Date | | | 08/26/2019 | 11/06/2019 | 07/05/2018 | 02/12/2019 | 05/01/2019 | 05/01/2019 | 08/26/2019 | 11/06/2019 | 05/10/2018 | 05/10/2018 | 07/05/2018 | 02/21/2019 | 05/10/2019 | 09/04/2019 | 11/11/2019 | 02/25/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0071 | <0.0078 | <0.0069 | <0.0074 | <0.0073 | <0.0072 | <0.0068 | <0.0074 | <0.0076 | <0.0073 | <0.007 | <0.0069 | <0.0071 | <0.0075 | <0.0077 | <0.0072 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.092 | 0.08 | 0.018 | 0.021 | 0.012 | 0.014 | 0.015 | 0.013 | <0.0038 | 0.011 | 0.011 | 0.014 | 0.012 | 0.014 | 0.015 | 0.0077 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | 0.022 | 0.025 | 0.026 | 0.023 | 0.026 | 0.047 | 0.038 | 0.0046 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0071 | <0.0078 | <0.0069 | <0.0074 | <0.0073 | <0.0072 | <0.0068 | <0.0074 | <0.0076 | <0.0073 | <0.007 | <0.0069 | <0.0071 | <0.0075 | <0.0077 | <0.0072 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | 0.2 | 0.026 | 0.031 | 0.032 | 0.027 | 0.025 | 0.021 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | <0.0039 | 0.004 | 0.0042 | 0.0042 | 0.0043 | 0.0037 | 0.0037 | 0.0074 | 0.031 | 0.033 | 0.036 | 0.035 | 0.039 | 0.043 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.011 | 0.01 | 0.016 | 0.019 | 0.016 | 0.016 | 0.017 | 0.02 | 0.042 | 0.13 | 0.11 | 0.13 | 0.13 | 0.18 | 0.21 | 0.0098 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.011 | 0.0099 | 0.006 | 0.0069 | 0.0062 | 0.0063 | 0.0061 | 0.0056 | 0.0069 | 0.0073 | 0.0063 | 0.0075 | 0.0081 | 0.0099 | 0.011 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.0055 | 0.0049 | 0.0051 | 0.0048 | 0.0047 | 0.005 | 0.0054 | 0.007 | 0.017 | 0.045 | 0.04 | 0.047 | 0.049 | 0.062 | 0.067 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.012 | 0.011 | 0.0045 | 0.0038 | 0.0042 | <0.0036 | 0.004 | 0.0057 | 0.0083 | 0.021 | 0.019 | 0.022 | 0.025 | 0.03 | 0.029 | 0.0042 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 0.033 | 0.031 | 0.05 | 0.055 | 0.052 | 0.051 | 0.066 | 0.092 | 0.21 | 0.47 | 0.47 | 0.53 | 0.54 | 0.73 | 0.77 | 0.023 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | 0.0052 | 0.0055 | ***0.042*** | ***0.058*** | ***0.046*** | ***0.048*** | ***0.042*** | ***0.034*** | ***1.6*** | ***0.36*** | ***0.59*** | ***0.54*** | ***0.47*** | ***0.47*** | ***0.48*** | ***0.31*** |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.038 | 0.037 | 0.092 | 0.11 | 0.098 | 0.099 | 0.11 | 0.13 | 1.8 | 0.83 | 1.1 | 1.1 | 1 | 1.2 | 1.3 | 0.33 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.0096 | 0.009 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | 0.0076 | 0.0071 | 0.0083 | 0.0086 | 0.01 | 0.011 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0039 | <0.0035 | <0.0037 | <0.0036 | <0.0036 | <0.0034 | <0.0037 | <0.0038 | <0.0036 | <0.0035 | <0.0034 | <0.0035 | <0.0037 | <0.0038 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.18 | 0.2 | 0.15 | 0.17 | 0.15 | 0.14 | 0.16 | 0.18 | 2.1 | 1.1 | 1.3 | 1.4 | 1.3 | 1.6 | 1.7 | 0.36 |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-PMW-10 | WV-PMW-10 | WV-PMW-10 | WV-PMW-10 | WV-MW-10D | WV-MW-10D | WV-MW-10D | WV-MW-10M | WV-MW-10M | WV-MW-10M | WV-MW-10S | WV-MW-10S | WV-MW-10S | WV-PMW-11 | WV-PMW-11 | WV-PMW-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | WV-MW-10 (18-28) | WV-MW-10 (26-36) | WV-MW-10 (66-76) | WV-MW-10 (163-168) | WV-GW-MW10D | WV-GW-MW10D | WV-GW-MW-10D | WV-GW-MW10M | WV-GW-MW10M | WV-GW-MW-10M | WV-GW-MW10S | WV-GW-MW10S | WV-GW-MW-10S | SB-11 20-25 | SB-11 29-34 | SB-11-107.5-112.5 |
| Well Screen Interval (Feet below ground surface) | | | 18-28 | 26-36 | 66-76 | 163-168 | 165-170 | 165-170 | 165-170 | 69.9-74.9 | 69.9-74.9 | 69.9-74.9 | 7-12 | 7-12 | 7-12 | 20-25 | 29-34 | 107.5-112.5 |
| Laboratory Sample ID | | | UB28083-002 | UB28083-003 | UB28083-004 | UC21100-001 | UE09028-004 | UH29005-011 | UK07025-003 | UE02030-002 | UH29005-009 | UK07025-002 | UE02030-001 | UH29005-010 | UK07025-001 | UA05034-001 | UA05034-002 | UA11012-001 |
| Sample Date | | | 02/25/2019 | 02/26/2019 | 02/27/2019 | 03/13/2019 | 05/08/2019 | 08/27/2019 | 11/06/2019 | 04/30/2019 | 08/27/2019 | 11/06/2019 | 04/30/2019 | 08/27/2019 | 11/06/2019 | 01/03/2019 | 01/03/2019 | 01/08/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0083 | <0.0075 | <0.0073 | <0.0073 | <0.0072 | <0.0071 | <0.0078 | <0.0071 | <0.0072 | <0.0074 | <0.0073 | <0.0071 | <0.007 | <0.0072 | <0.0071 | <0.0071 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | 0.0059 | 0.0039 | 0.0042 | 0.0039 | <0.0036 | <0.0036 | <0.0037 | 0.011 | 0.013 | 0.009 | 0.0051 | <0.0036 | <0.0036 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | 0.014 | 0.014 | 0.016 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0083 | <0.0075 | <0.0073 | <0.0073 | <0.0072 | <0.0071 | <0.0078 | <0.0071 | <0.0072 | <0.0074 | <0.0073 | <0.0071 | <0.007 | <0.0072 | <0.0071 | <0.0071 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | 0.006 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | 0.0057 | 0.006 | 0.0044 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | 0.023 | 0.029 | 0.021 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | 0.0037 | 0.01 | 0.0051 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | 0.0053 | 0.012 | 0.0081 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | 0.013 | 0.0048 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | <0.0021 | <0.0019 | <0.0018 | 0.0045 | 0.0027 | 0.0029 | 0.0026 | <0.0018 | <0.0018 | <0.0018 | 0.061 | 0.11 | 0.092 | 0.0029 | <0.0018 | <0.0018 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | 0.0082 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | ***0.49*** | ***1*** | ***0.69*** | <0.0036 | <0.0036 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.0082 | ND | ND | 0.0045 | 0.0027 | 0.0029 | 0.0026 | ND | ND | ND | 0.55 | 1.1 | 0.78 | 0.0029 | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | 0.0092 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0041 | <0.0038 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0039 | <0.0036 | <0.0036 | <0.0037 | <0.0037 | <0.0035 | <0.0035 | <0.0036 | <0.0036 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.0082 | ND | ND | 0.016 | 0.0066 | 0.0071 | 0.0065 | ND | ND | ND | 0.61 | 1.2 | 0.85 | 0.008 | ND | ND |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-PMW-11 | WV-PMW-11 | WV-PMW-11 | WV-PMW-11 | WV-PMW-11 | WV-MW-11D | WV-MW-11D | WV-MW-11D | WV-MW-11D | WV-MW-11D | WV-MW-11S | WV-MW-11S | WV-MW-11S | WV-MW-11S | WV-PMW-12 | WV-PMW-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | SB-11-118-123 | SB-11-128-133 | SB-11-138-143 | SB-11-148-153 | SB-11-158.5-163.5 | MW-WV-11D | WV-GW-MW11D | WV-GW-MW11D | WV-GW-MW-11D | WV-GW-MW-11D DUP | MW-WV-11S | WV-GW-MW11S | WV-GW-MW11S | WV-GW-MW-11S | SB-12 75-80 | SB-12 85-90 |
| Well Screen Interval (Feet below ground surface) | | | 118-123 | 128-133 | 138-143 | 148-153 | 158.5-163.5 | 158.9-163.9 | 158.9-163.9 | 158.9-163.9 | 158.9-163.9 | 158.9-163.9 | 29.4-34.4 | 29.4-34.4 | 29.4-34.4 | 29.4-34.4 | 75-80 | 85-90 |
| Laboratory Sample ID | | | UA11012-002 | UA11012-003 | UA11012-004 | UA11012-005 | UA11012-006 | UB16022-001 | UE02030-012 | UH29005-012 | UK07051-006 | UK07051-007 | UB16022-002 | UE02030-013 | UH29005-013 | UK07051-008 | TJ31080-001 | TJ31080-002 |
| Sample Date | | | 01/08/2019 | 01/08/2019 | 01/09/2019 | 01/09/2019 | 01/09/2019 | 02/14/2019 | 05/02/2019 | 08/27/2019 | 11/05/2019 | 11/05/2019 | 02/14/2019 | 05/02/2019 | 08/27/2019 | 11/05/2019 | 10/29/2018 | 10/29/2018 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0072 | <0.0071 | <0.0072 | <0.0072 | <0.0071 | <0.0073 | <0.0072 | <0.0081 | <0.0074 | <0.0074 | <0.0072 | <0.0072 | <0.0071 | <0.0072 | <0.0072 | <0.0086 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0072 | <0.0071 | <0.0072 | <0.0072 | <0.0071 | <0.0073 | <0.0072 | <0.0081 | <0.0074 | <0.0074 | <0.0072 | <0.0072 | <0.0071 | <0.0072 | <0.0072 | <0.0086 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.002 | <0.0019 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0018 | <0.0021 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0035 | <0.0037 | <0.0036 | <0.004 | <0.0037 | <0.0037 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0043 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-PMW-12 | WV-PMW-12 | WV-PMW-12 | WV-PMW-12 | WV-MW-12D | WV-MW-12D | WV-MW-12D | WV-MW-12D | WV-MW-12M | WV-MW-12M | WV-MW-12M | WV-MW-12M | WV-MW-12S | WV-PMW-13 | WV-MW-12S | WV-MW-12S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | SB-12 145-150 | SB-12 155-160 | SB-12 165-170 | SB-12 175-180 | MW-WV-12D | WV-GW-MW12D | WV-GW-MW12D | WV-GW-MW-12D | MW-WV-12M | WV-GW-MW12M | WV-GW-MW12M | WV-GW-MW-12M | MW-WV-12S | WV-MW-13(0-10) | WV-GW-MW12S | WV-GW-MW12S |
| Well Screen Interval (Feet below ground surface) | | | 145-150 | 155-160 | 165-170 | 175-180 | 179.2-184.2 | 179.2-184.2 | 179.2-184.2 | 179.2-184.2 | 146.6-151.6 | 146.6-151.6 | 146.6-151.6 | 146.6-151.6 | 75.8-80.8 | 0-10 | 75.8-80.8 | 75.8-80.8 |
| Laboratory Sample ID | | | TL01010-001 | TL01010-002 | TL01010-003 | TL01010-004 | UB14084-006 | UE09028-006 | UH31001-004 | UK09008-003 | UB14084-004 | UE09028-007 | UH31001-007 | UK09008-002 | UB14084-003 | UB16023-001 | UE09028-008 | UH31001-003 |
| Sample Date | | | 11/26/2018 | 11/27/2018 | 11/27/2018 | 11/29/2018 | 02/13/2019 | 05/07/2019 | 08/29/2019 | 11/07/2019 | 02/13/2019 | 05/07/2019 | 08/30/2019 | 11/07/2019 | 02/12/2019 | 02/14/2019 | 05/07/2019 | 08/29/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.026 | <0.023 | <0.011 | <0.0078 | <0.0074 | <0.0071 | <0.007 | <0.0071 | <0.0074 | <0.0074 | <0.0068 | <0.0068 | <0.0072 | <0.0077 | <0.0071 | <0.0072 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | 0.0045 | <0.0035 | <0.0036 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.026 | <0.023 | <0.011 | <0.0078 | <0.0074 | <0.0071 | <0.007 | <0.0071 | <0.0074 | <0.0074 | <0.0068 | <0.0068 | <0.0072 | <0.0077 | <0.0071 | <0.0072 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | 0.0059 | <0.0035 | <0.0036 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | 0.0066 | <0.0035 | <0.0036 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 0.008 | <0.0057 | 0.0034 | <0.002 | <0.0018 | <0.0018 | <0.0017 | <0.0018 | <0.0018 | <0.0018 | <0.0017 | <0.0017 | <0.0018 | 0.029 | <0.0018 | <0.0018 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | ***0.13*** | <0.0035 | <0.0036 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.008 | ND | 0.0034 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.16 | ND | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.013 | <0.011 | <0.0056 | <0.0039 | <0.0037 | <0.0035 | <0.0035 | <0.0035 | <0.0037 | <0.0037 | <0.0034 | <0.0034 | <0.0036 | <0.0038 | <0.0035 | <0.0036 |
| Total PFAS (Calculated) | NCL | NCL | 0.008 | ND | 0.0034 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.18 | ND | ND |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-12S | WV-PMW-13 | WV-PMW-13 | WV-PMW-13 | WV-PMW-13 | WV-MW-13D | WV-MW-13D | WV-MW-13D | WV-MW-13M | WV-MW-13M | WV-MW-13M | WV-MW-13S | WV-MW-13S | WV-MW-13S | WV-PMW-14 | WV-PMW-14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | WV-GW-MW-12S | WV-MW-13(10-20) | WV-MW-13 (35-45) | WV-MW-13 (45-55) | WV-MW-13 (53-63) | WV-GW-MW13D | WV-GW-MW13D | WV-GW-MW13D | WV-GW-MW13M | WV-GW-MW13M | WV-GW-MW-13M | WV-GW-MW13S | WV-GW-MW13S | WV-GW-MW-13S | WV-MW-14 (139-144) | WV-MW-14 (9-14) |
| Well Screen Interval (Feet below ground surface) | | | 75.8-80.8 | 10-20 | 35-45 | 45-55 | 53-63 | 58.8-63.8 | 58.8-63.8 | 58.8-63.8 | 18.1-23.1 | 18.1-23.1 | 18.1-23.1 | 1.7-6.7 | 1.7-6.7 | 1.7-6.7 | 139-144 | 9-14 |
| Laboratory Sample ID | | | UK09008-001 | UB16023-002 | UB20051-007 | UB20051-008 | UB20051-009 | UE09028-002 | UH29005-017 | UK09008-006 | UE09028-001 | UH29005-019 | UK09008-005 | UE09028-003 | UH29005-016 | UK09008-004 | UD30028-001 | UD20015-001 |
| Sample Date | | | 11/07/2019 | 02/14/2019 | 02/18/2019 | 02/18/2019 | 02/18/2019 | 05/08/2019 | 08/28/2019 | 11/07/2019 | 05/08/2019 | 08/28/2019 | 11/07/2019 | 05/08/2019 | 08/28/2019 | 11/07/2019 | 04/24/2019 | 04/15/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0079 | <0.0084 | <0.007 | <0.0073 | <0.007 | <0.0072 | <0.0073 | <0.0076 | <0.007 | <0.0072 | <0.0072 | <0.0072 | <0.0072 | <0.0076 | <0.0072 | <0.0073 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.004 | <0.0042 | 0.0053 | 0.011 | 0.01 | 0.01 | 0.01 | 0.0098 | 0.0052 | 0.0047 | 0.005 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | 0.015 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0079 | <0.0084 | <0.007 | <0.0073 | <0.007 | <0.0072 | <0.0073 | <0.0076 | <0.007 | <0.0072 | <0.0072 | <0.0072 | <0.0072 | <0.0076 | <0.0072 | <0.0073 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | 0.0038 | 0.005 | 0.0048 | 0.0056 | <0.0036 | <0.0036 | 0.004 | <0.0036 | 0.0062 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | 0.0052 | 0.0066 | 0.0062 | 0.0045 | 0.0076 | 0.0078 | <0.0036 | <0.0037 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | <0.002 | 0.0091 | 0.0032 | 0.0023 | 0.0025 | 0.0027 | 0.0031 | 0.003 | 0.012 | 0.016 | 0.015 | 0.011 | 0.014 | 0.018 | <0.0018 | 0.011 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.004 | ***0.014*** | 0.0062 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | ***0.016*** | ***0.017*** | ***0.017*** | ***0.022*** | ***0.041*** | ***0.085*** | <0.0036 | 0.0059 |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | 0.023 | 0.0094 | 0.0023 | 0.0025 | 0.0027 | 0.0031 | 0.003 | 0.028 | 0.033 | 0.032 | 0.033 | 0.055 | 0.1 | ND | 0.017 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.004 | <0.0042 | <0.0035 | <0.0037 | <0.0035 | <0.0036 | <0.0036 | <0.0038 | <0.0035 | <0.0036 | <0.0036 | <0.0036 | <0.0036 | <0.0038 | <0.0036 | <0.0037 |
| Total PFAS (Calculated) | NCL | NCL | ND | 0.0 | 0.015 | 0.013 | 0.013 | 0.013 | 0.013 | 0.017 | 0.043 | 0.049 | 0.049 | 0.038 | 0.063 | 0.11 | ND | 0.038 |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-14D | WV-MW-14D | WV-MW-14S | WV-MW-14S | WV-PMW-15 | WV-PMW-15 | WV-PMW-15 | WV-MW-15A | WV-MW-15B | WV-MW-15C | WV-PMW-16 | WV-MW-15D | WV-MW-15D | WV-PMW-16 | WV-PMW-16 | WV-MW-16D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Name | | | WV-GW-MW14D | VW-GW-MW-14D | WV-GW-MW14S | WV-GW-MW-14S | WV-MW-15 (9-14) | WV-MW-15 33-38 | WV-MW-15 43-48 | WV-GW-MW-15A | WV-GW-MW-15B | WV-GW-MW-15C | WV-MW-16 (4-14) | WV-GW-MW-15D | WV-GW-MW-15D DUP | WV-MW-16 (12-22) | WV-MW-16 (86-96) | WV-GW-MW16D |
| Well Screen Interval (Feet below ground surface) | | | 142.3-147.3 | 142.3-147.3 | 8.9-13.9 | 8.9-13.9 | 9-14 | 33-38 | 43-48 | 9-14 | 33.1-38.1 | 43.7-48.5 | 4-14 | 135.1-137.8 | 135.1-137.8 | 12-22 | 86-96 | 91.7-96.7 |
| Laboratory Sample ID | | | UH29005-018 | UK09009-002 | UH29005-015 | UK09008-007 | UH22047-001 | UH23038-001 | UH23038-002 | UK13023-008 | UK13023-009 | UK13023-010 | UC23027-001 | UK13023-013 | UK13023-014 | UC23027-002 | UC23027-003 | UE09028-005 |
| Sample Date | | | 08/28/2019 | 11/08/2019 | 08/28/2019 | 11/07/2019 | 08/19/2019 | 08/21/2019 | 08/21/2019 | 11/11/2019 | 11/11/2019 | 11/11/2019 | 03/19/2019 | 11/11/2019 | 11/11/2019 | 03/20/2019 | 03/22/2019 | 05/08/2019 |
| Parameter (µg/L) | | | | | | | | | | | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | 0.006 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0068 | <0.007 | <0.0068 | <0.0076 | <0.0069 | <0.0076 | <0.0072 | <0.0077 | <0.0076 | <0.0074 | <0.0071 | <0.0074 | <0.0075 | <0.0073 | <0.0083 | <0.0074 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | 0.029 | 0.03 | 0.015 | 0.008 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | 0.0083 | <0.0037 | <0.0038 | 0.025 | <0.0042 | <0.0037 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | 0.0035 | 0.0036 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0068 | <0.007 | <0.0068 | <0.0076 | <0.0069 | <0.0076 | <0.0072 | <0.0077 | <0.0076 | <0.0074 | <0.0071 | <0.0074 | <0.0075 | <0.0073 | <0.0083 | <0.0074 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | 0.064 | 0.07 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | 0.006 | <0.0042 | <0.0037 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | 0.17 | 0.16 | 0.0085 | 0.01 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | 0.011 | <0.0042 | <0.0037 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | 0.011 | 0.0099 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | 0.01 | <0.0037 | <0.0038 | 0.059 | <0.0042 | <0.0037 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | 0.083 | 0.076 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | 0.019 | <0.0042 | <0.0037 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | 0.033 | 0.033 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | 0.0083 | <0.0037 | <0.0038 | 0.055 | <0.0042 | <0.0037 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | 0.54 | 0.52 | 0.0065 | 0.013 | <0.0017 | <0.0019 | <0.0018 | <0.0019 | <0.0019 | <0.0019 | 0.01 | <0.0018 | <0.0019 | 0.054 | 0.0024 | <0.0019 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | 0.007 | 0.0074 | <0.0034 | 0.009 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | ***0.021*** | <0.0037 | <0.0038 | ***0.066*** | <0.0042 | <0.0037 |
| PFOA + PFOS (Calculated) | NCL | NCL | 0.55 | 0.53 | 0.0065 | 0.022 | ND | ND | ND | ND | ND | ND | 0.031 | ND | ND | 0.12 | 0.0024 | ND |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | 0.012 | 0.012 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | 0.0043 | <0.0037 | <0.0038 | 0.026 | <0.0042 | <0.0037 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0034 | <0.0035 | <0.0034 | <0.0038 | <0.0034 | <0.0038 | <0.0036 | <0.0038 | <0.0038 | <0.0037 | <0.0036 | <0.0037 | <0.0038 | <0.0037 | <0.0042 | <0.0037 |
| Total PFAS (Calculated) | NCL | NCL | 0.95 | 0.9 | 0.03 | 0.04 | ND | ND | ND | ND | ND | ND | 0.062 | ND | ND | 0.32 | 0.0084 | ND |

**TABLE 4**
GROUNDWATER ANALYTICAL DATA - PFAS
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

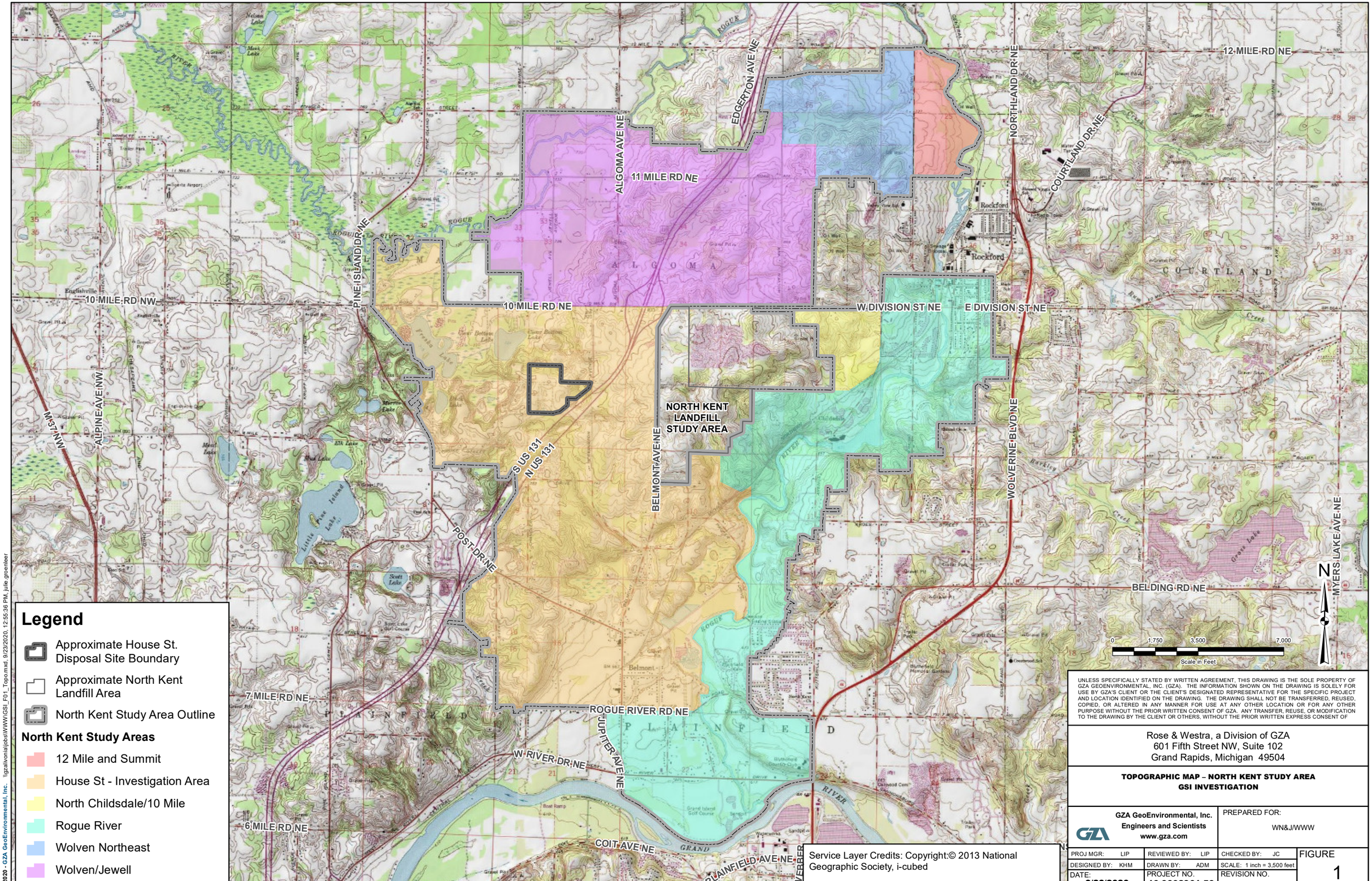
| Sample Location | Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2] | Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2] | WV-MW-16D | WV-MW-16D | WV-MW-16S | WV-MW-16S | WV-MW-16S | WV-MW-16S |
|---|---|---|---|---|---|---|---|---|
| Sample Name | | | WV-GW-MW16D | WV-GW-MW-16D | WV-GW-MW16S | WV-GW-MW16S | WV-GW-MW16S DUP | WV-GW-MW-16S |
| Well Screen Interval (Feet below ground surface) | | | 91.7-96.7 | 91.7-96.7 | 17.5-22.5 | 17.5-22.5 | 17.5-22.5 | 17.5-22.5 |
| Laboratory Sample ID | | | UH31001-005 | UK13023-001 | UE02030-006 | UH31001-001 | UH31001-002 | UK19013-001 |
| Sample Date | | | 08/29/2019 | 11/12/2019 | 05/03/2019 | 08/29/2019 | 08/29/2019 | 11/13/2019 |
| Parameter (µg/L) | | | | | | | | |
| 8:2 Fluorotelomer sulfonic acid (8:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| 6:2 Fluorotelomer sulfonic acid (6:2 FTS) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamide (EtFOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| N-Ethyl perfluorooctane sulfonamidoethanol (N-EtFOSE) | NCL | NCL | - | - | - | - | - | - |
| N-Methyl perfluorooctane sulfonamide (MeFOSA) | NCL | NCL | <0.0072 | <0.007 | <0.0071 | <0.007 | <0.0074 | <0.0074 |
| N-Methyl perfluorooctane sulfonamidoethanol (N-MeFOSE) | NCL | NCL | - | - | - | - | - | - |
| Perfluorobutane sulfonic acid (PFBS) | NCL | NCL | <0.0036 | <0.0035 | 0.0073 | 0.016 | 0.018 | 0.016 |
| Perfluorodecane sulfonic acid (PFDS) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Perfluoroheptane sulfonic acid (PFHpS) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Perfluorononane sulfonic acid (PFNS) | NCL | NCL | <0.0072 | <0.007 | <0.0071 | <0.007 | <0.0074 | <0.0074 |
| Perfluorooctane sulfonamide (FOSA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Perfluoropentane sulfonic acid (PFPeS) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | 0.004 | <0.0037 |
| Perfluorohexane sulfonic acid (PFHxS) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | 0.0068 | 0.007 | 0.0072 |
| Perfluorobutanoic acid (PFBA) | NCL | NCL | <0.0036 | <0.0035 | 0.0074 | 0.028 | 0.029 | 0.02 |
| Perfluorodecanoic acid (PFDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Perfluorododecanoic acid (PFDoDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Perfluoroheptanoic acid (PFHpA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | 0.0076 | 0.0085 | 0.0054 |
| Perfluorohexanoic acid (PFHxA) | NCL | NCL | <0.0036 | <0.0035 | 0.0061 | 0.023 | 0.023 | 0.013 |
| Perfluorononanoic acid (PFNA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Perfluorooctanoic acid (PFOA) | 8.0 (A) | 12 | <0.0018 | <0.0018 | 0.0094 | 0.026 | 0.029 | 0.021 |
| ***Perfluorooctane sulfonic acid (PFOS)*** | 16 (A) | 0.012 | <0.0036 | <0.0035 | ***0.026*** | ***0.023*** | ***0.025*** | ***0.027*** |
| PFOA + PFOS (Calculated) | NCL | NCL | ND | ND | 0.035 | 0.049 | 0.054 | 0.048 |
| Perfluoropentanoic acid (PFPeA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | 0.0097 | 0.011 | 0.007 |
| Perfluorotetradecanoic acid (PFTeDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Perfluorotridecanoic acid (PFTrDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Perfluoroundecanoic acid (PFUnDA) | NCL | NCL | <0.0036 | <0.0035 | <0.0036 | <0.0035 | <0.0037 | <0.0037 |
| Total PFAS (Calculated) | NCL | NCL | ND | ND | 0.056 | 0.14 | 0.15 | 0.12 |

**TABLE 4 NOTES**
Wolven/Jewell Study Areas
Algoma Township, Kent County, MI

**NOTES:**

1. Concentration and criteria units are micrograms per Liter (µg/L) or parts per billion (ppb). Calculated criteria and concentrations are rounded to two significant digits. "ND" indicates the parameters used in the calculation were not detected.
2. Michigan Part 201 Groundwater Cleanup Criteria are based on "Table 1, Groundwater: Residential and Nonresidential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Tier I Risk Based Screening Levels," Michigan Administrative Code, Cleanup Criteria Requirements for Response Activity, Rules 299.44 and 299.49, effective December 30, 2013; updated August 3, 2020.
   Abbreviations Include:
   "NCL" indicates no criterion listed in EGLE Table 1.
   Footnotes Include:
   (A) - The criterion is the State of Michigan drinking water standard.
3. Bold, italic number with thick line border or italic parameter name indicates that parameter was detected above the Michigan Part 201 Groundwater Cleanup Criteria listed.
4. Abbreviations include:
   "< RL" indicates the parameter was analyzed for but not detected above the method detection limit; RL = Reporting Limit.
   "DUP" indicates a duplicate sample.
   "-" indicates the parameter was not analyzed.
5. Well screen interval presented is the top of the well screen to the bottom of the well screen in feet below ground surface.

# FIGURES




## Legend

- Approximate House St. Disposal Site Boundary
- Approximate North Kent Landfill Area
- North Kent Study Area Outline

**North Kent Study Areas**

- 12 Mile and Summit
- House St - Investigation Area
- North Childsdale/10 Mile
- Rogue River
- Wolven Northeast
- Wolven/Jewell

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

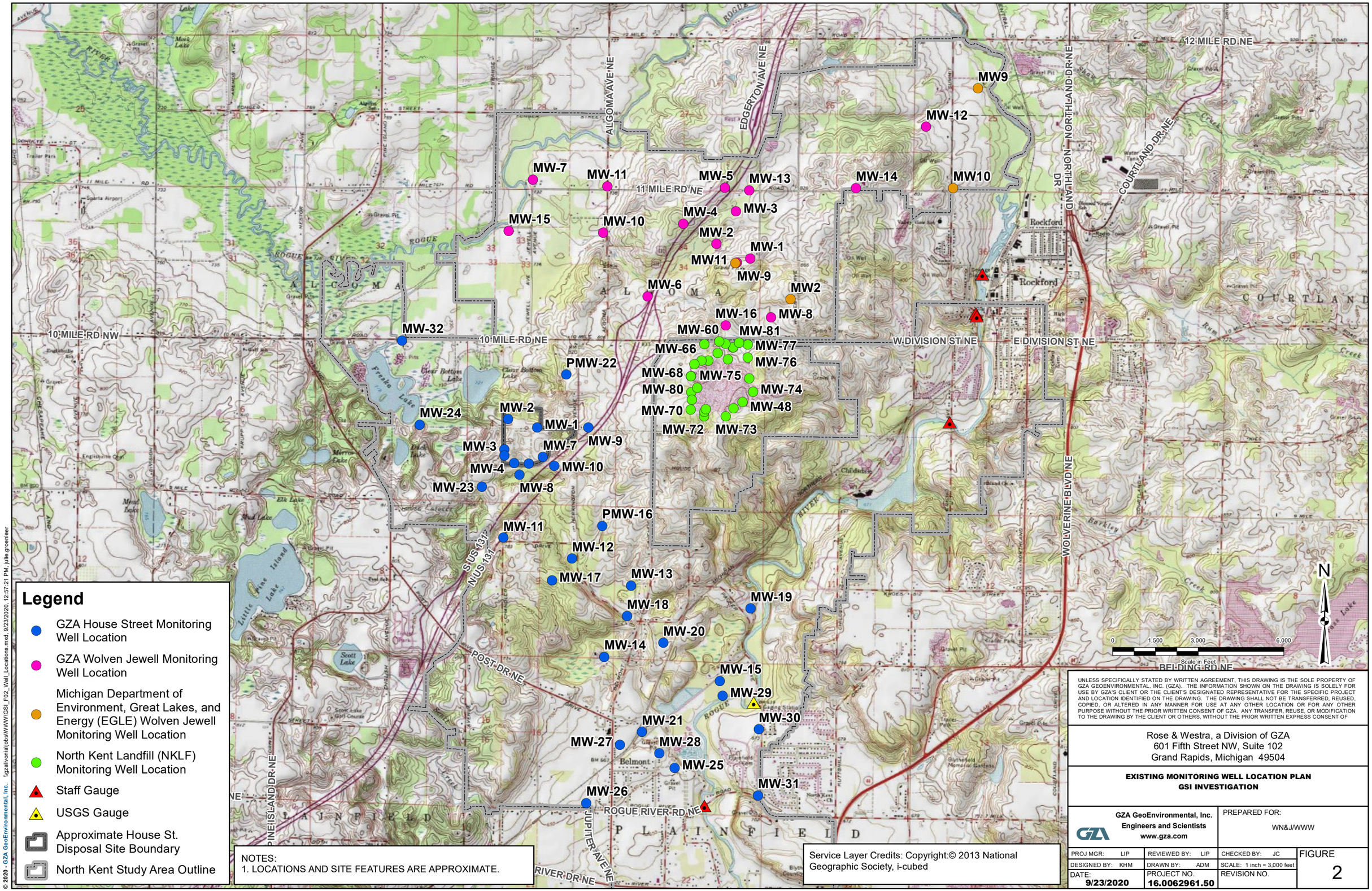
**TOPOGRAPHIC MAP – NORTH KENT STUDY AREA**
**GSI INVESTIGATION**

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 3,500 feet | 1 |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzailvonia\jobs\WWW\GSI_F01_Topo.mxd, 9/23/2020, 12:55:36 PM, julie.groenleer




NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

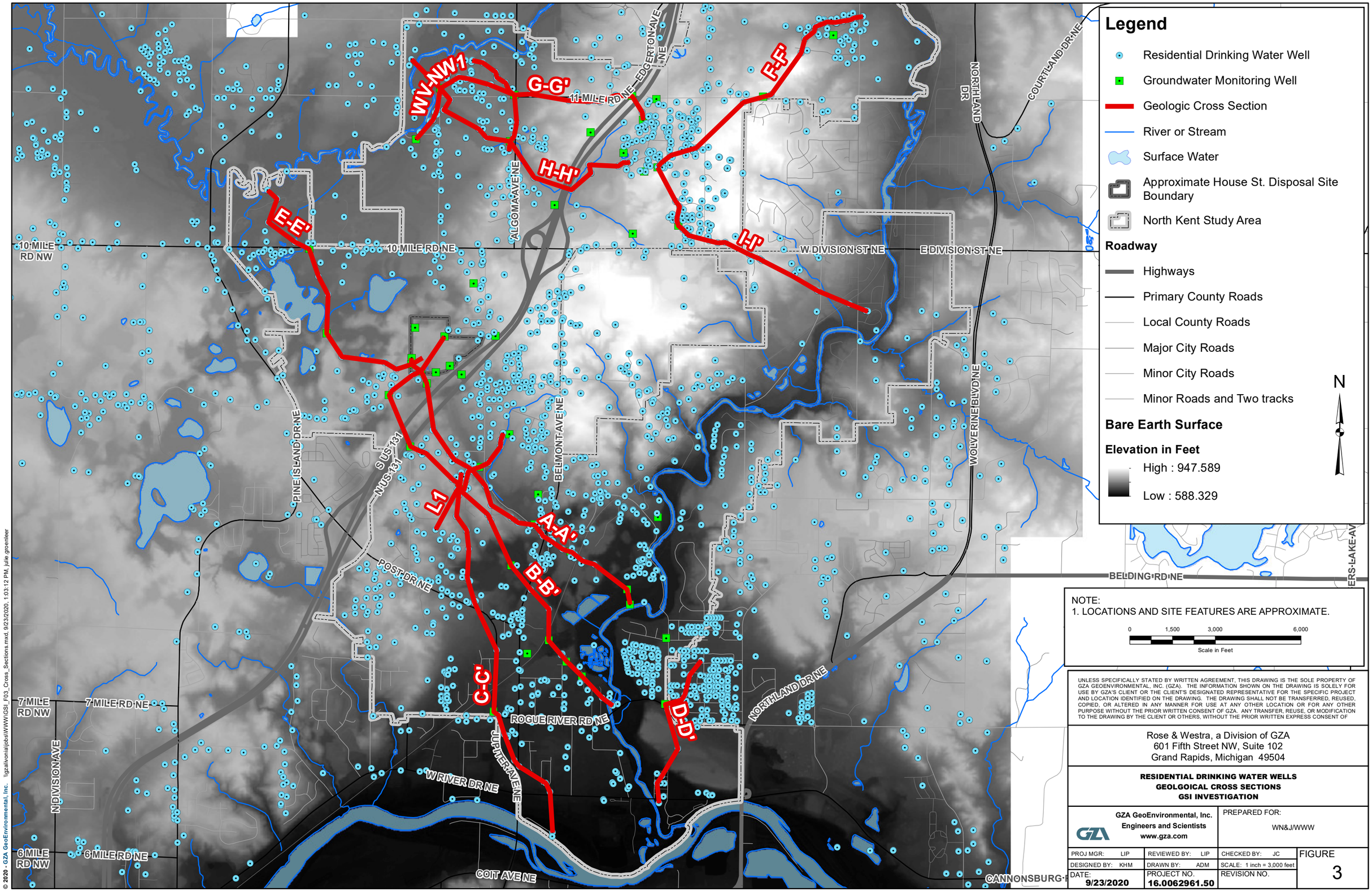
**EXISTING MONITORING WELL LOCATION PLAN**
**GSI INVESTIGATION**

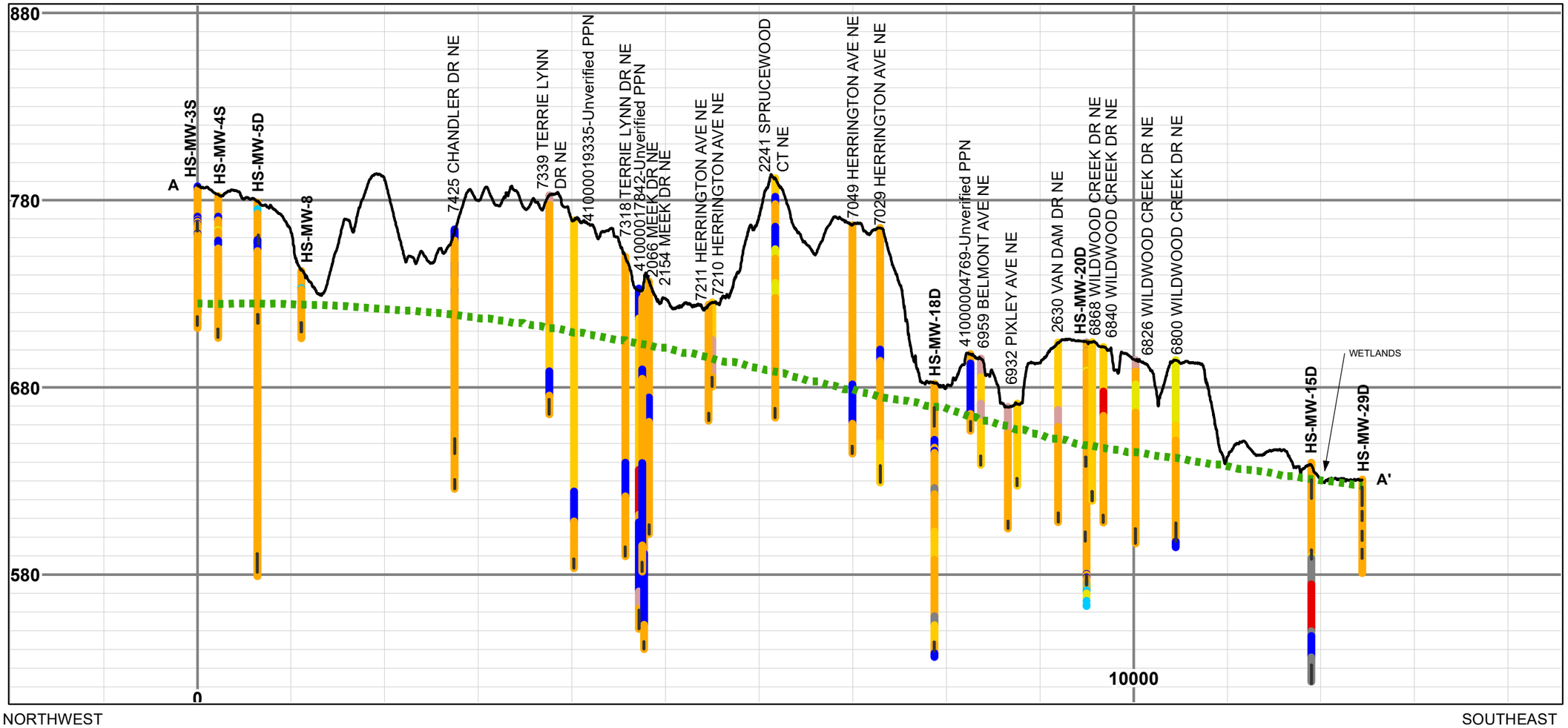
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 3,000 feet | 2 |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\jobs\WWW\GSI_F02_Well_Locations.mxd, 9/23/2020, 12:57:21 PM, julie.groenleer


Legend
Residential Drinking Water Well
Groundwater Monitoring Well
Geologic Cross Section
River or Stream
Surface Water
Approximate House St. Disposal Site Boundary
North Kent Study Area
Roadway
Highways
Primary County Roads
Local County Roads
Major City Roads
Minor City Roads
Minor Roads and Two tracks
Bare Earth Surface
Elevation in Feet
High : 947.589
Low : 588.329
N
WV-NW1
G-G'
F-F'
H-H'
E-E'
I-I'
L1
A-A'
B-B'
C-C'
D-D'
10 MILE RD NW
10 MILE RD NE
11 MILE RD NE
EDGERTON AVE NE
ALGOMA AVE NE
W DIVISION ST NE
E DIVISION ST NE
NORTHLAND DR
COURTLAND DR NE
PINE ISLAND DR NE
S US-131
N US-131
BELMONT AVE NE
WOLVERINE BLVD NE
POST DR NE
BELDING RD NE
7 MILE RD NW
7 MILE RD NE
N DIVISION AVE
ROGUE RIVER RD NE
NORTHLAND DR NE
JUPITER AVE NE
W RIVER DR NE
6 MILE RD NW
6 MILE RD NE
COIT AVE NE
NOTE:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.
0 1,500 3,000 6,000
Scale in Feet
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF
Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504
RESIDENTIAL DRINKING WATER WELLS
GEOLGOICAL CROSS SECTIONS
GSI INVESTIGATION
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com
PREPARED FOR:
WN&J/WWW
PROJ MGR: LIP
REVIEWED BY: LIP
CHECKED BY: JC
DESIGNED BY: KHM
DRAWN BY: ADM
SCALE: 1 inch = 3,000 feet
DATE: 9/23/2020
PROJECT NO. 16.0062961.50
REVISION NO.
FIGURE
3
© 2020 - GZA GeoEnvironmental, Inc. \\gzalvonia\jobs\WWW\GSI_F03_Cross_Sections.mxd, 9/23/2020, 1:03:12 PM, julie.groenleer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE

**BOREHOLE LITHOLOGY**

- GRAVEL
- SAND AND
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY AND SILT
- CLAY

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL

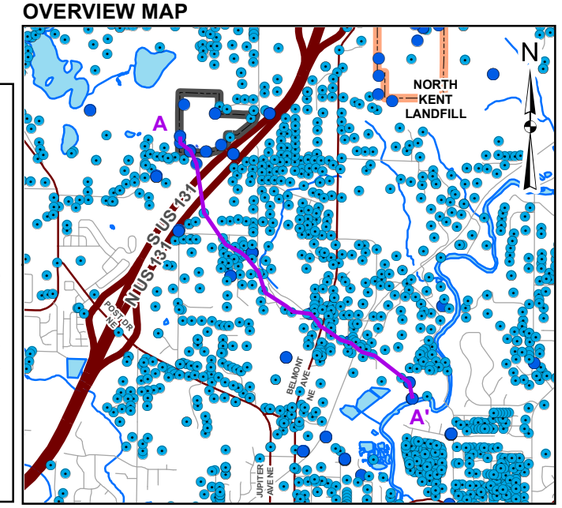
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 2,500 5,000 10,000
SCALE IN FEET

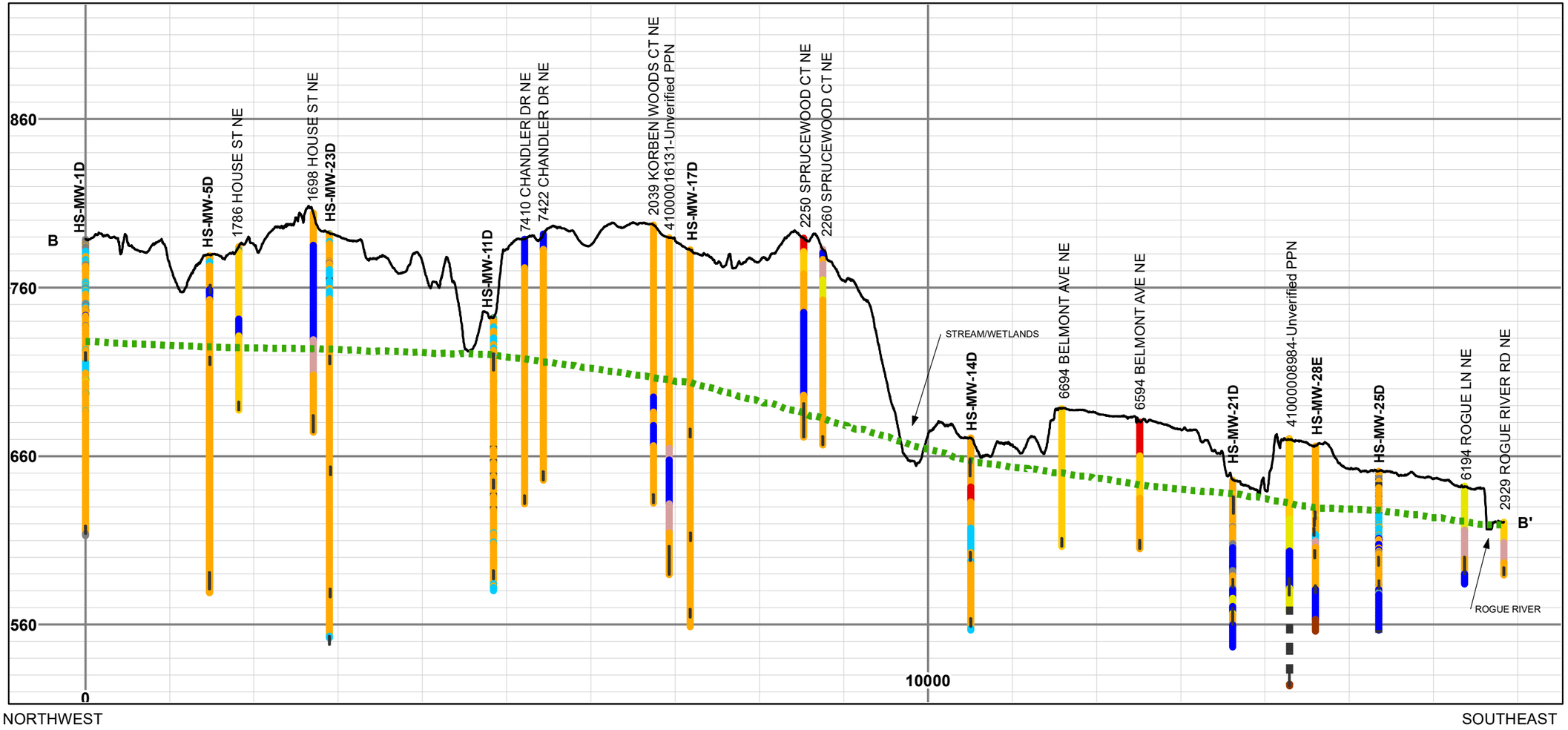
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

**NORTH KENT STUDY AREA**
**CROSS SECTION A-A'**
**GSI INVESTIGATION**

| | | | |
|---|---|---|---|
| PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com | | PREPARED FOR: WN&J/WWW | |
| PROJ MGR: LJP | REVIEWED BY: MW | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | SCALE: 1 in = 5,000 ft | 4 |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | REVISION NO: | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\jobs\WWW\GSI_F04_SectionA.mxd, September 17, 2020 - 7:00:29 PM, julie.groenleer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE
- GRAVEL
- SAND AND
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY AND SILT
- CLAY
- TOP SOIL
- BEDROCK
- NOT AVAILABLE

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL

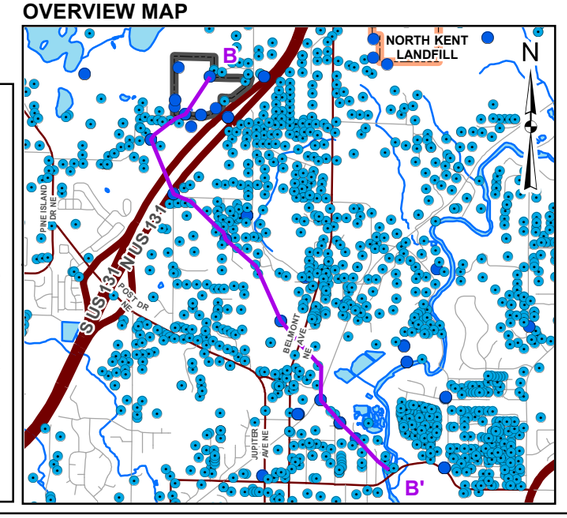
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 2,500 5,000 10,000
SCALE IN FEET

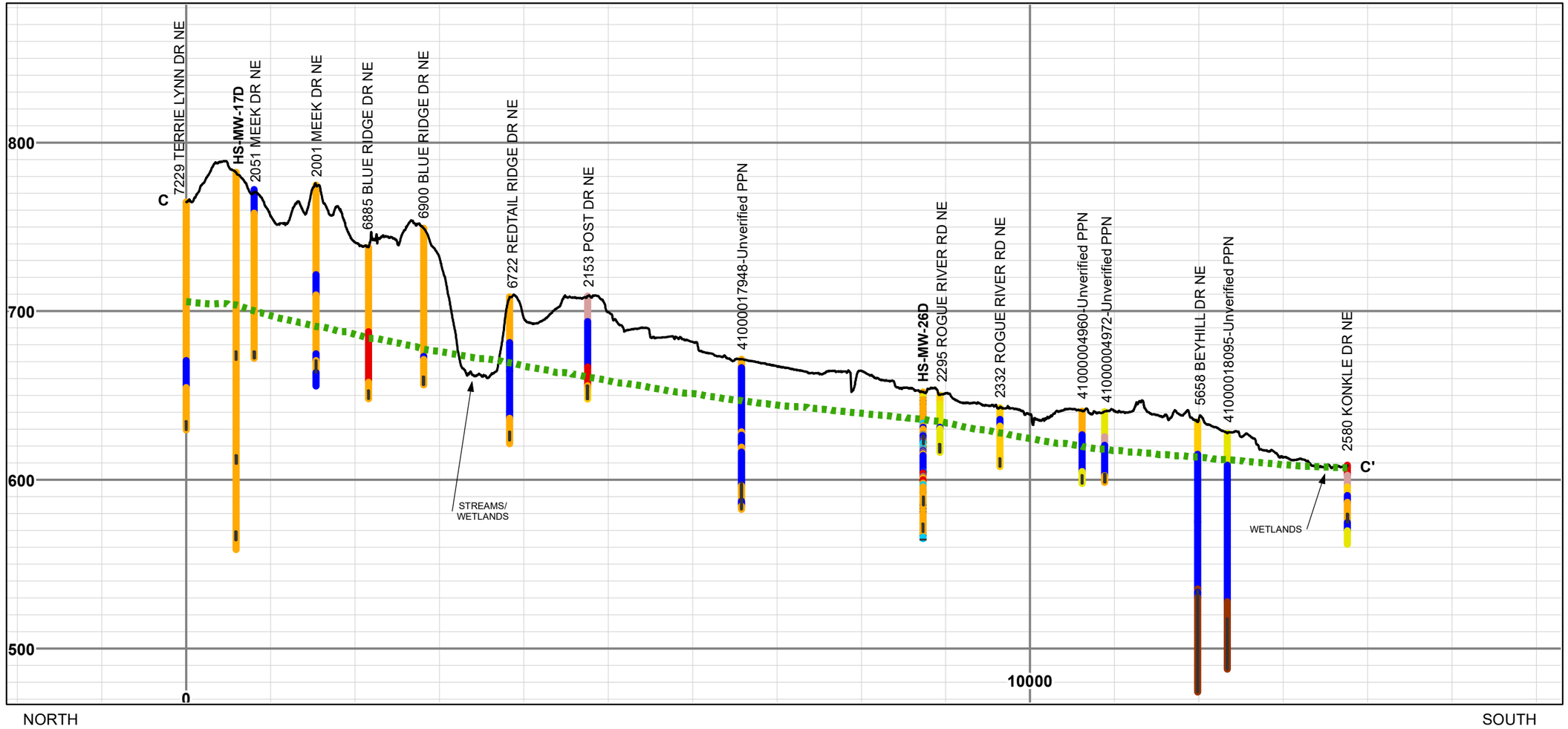
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

**NORTH KENT STUDY AREA**
**CROSS SECTION B-B'**
**GSI INVESTIGATION**

| PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com | | | PREPARED FOR: WN&J/WWW | |
|---|---|---|---|---|
| PROJ MGR: LJP | REVIEWED BY: MW | | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | | SCALE: 1 in = 5,000 ft | 5 |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | | REVISION NO: | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\obs\WWW\GSI_F05_SectionB.mxd, September 17, 2020 - 10:30:35 AM, julie.groenleer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE
- GRAVEL
- SAND AND GRAVEL
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY AND SILT
- CLAY
- BEDROCK
- NOT AVAILABLE

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER

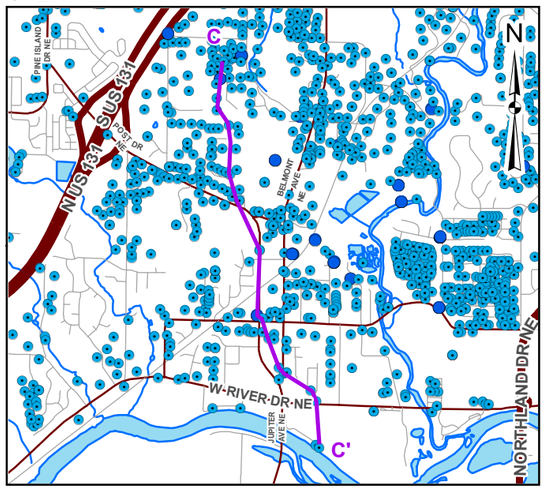
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 2,500 5,000 10,000
SCALE IN FEET

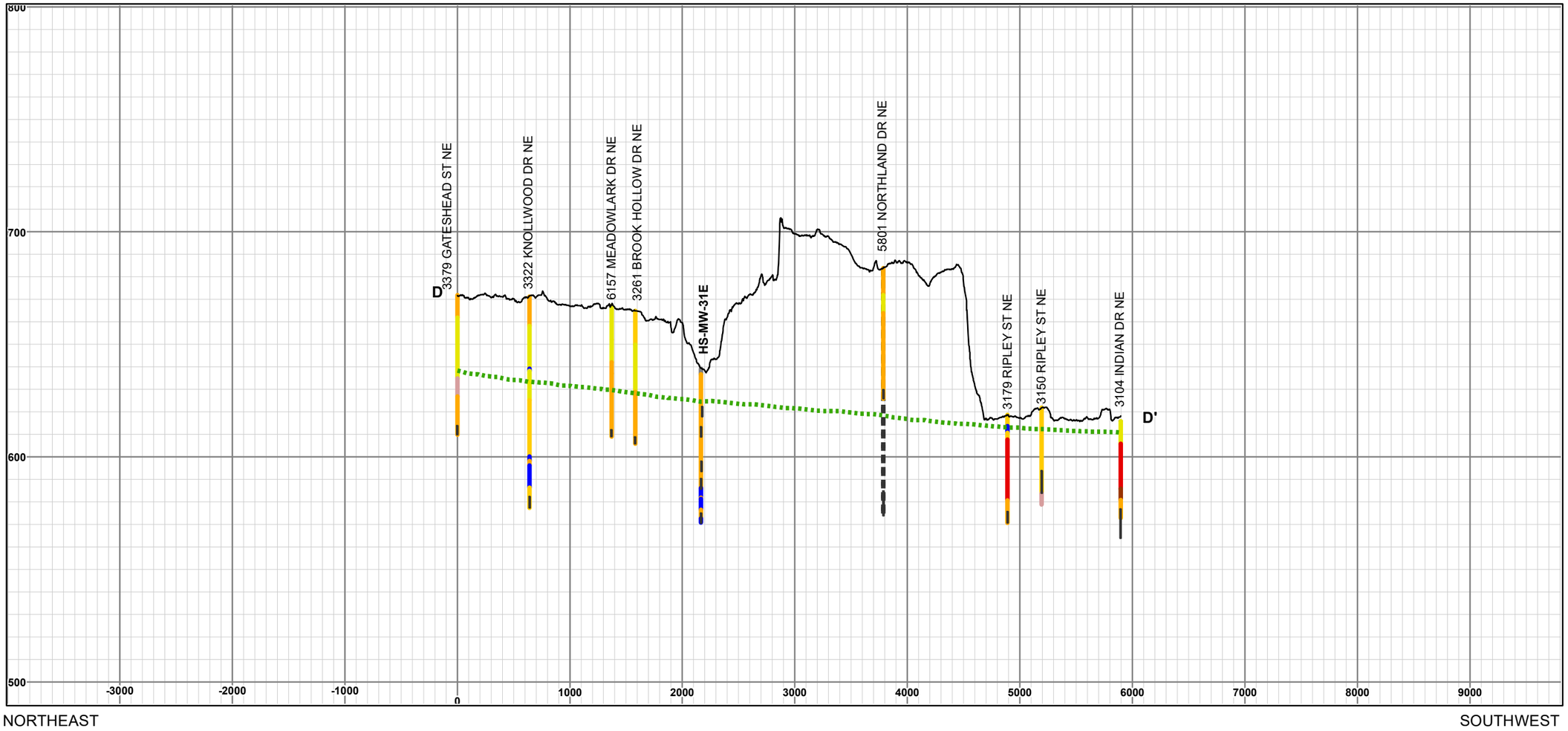
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

**NORTH KENT STUDY AREA**
**CROSS SECTION C-C'**
**GSI INVESTIGATION**

| | | | |
|---|---|---|---|
| PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com | | PREPARED FOR: WN&J/WWW | |
| PROJ MGR: LJP | REVIEWED BY: MW | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | SCALE: 1 in = 5,000 ft | 6 |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | REVISION NO: | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\jobs\WWW\GSI F06 SectionC.mxd September 17, 2020 - 10:50:30 AM julie.groenleer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE
- GRAVEL
- SAND AND GRAVEL
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY
- BEDROCK
- NOT AVAILABLE

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER

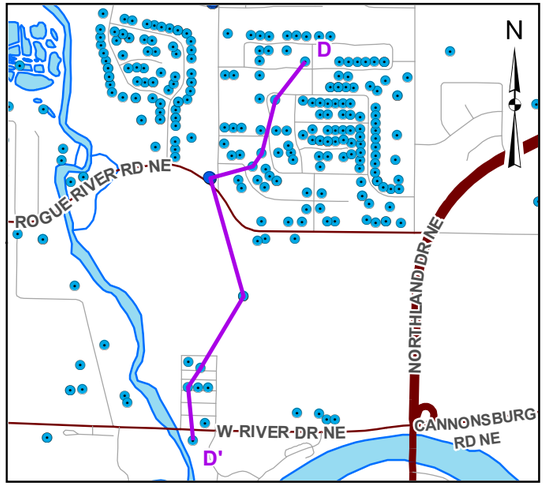
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 1,000 2,000 4,000
SCALE IN FEET

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

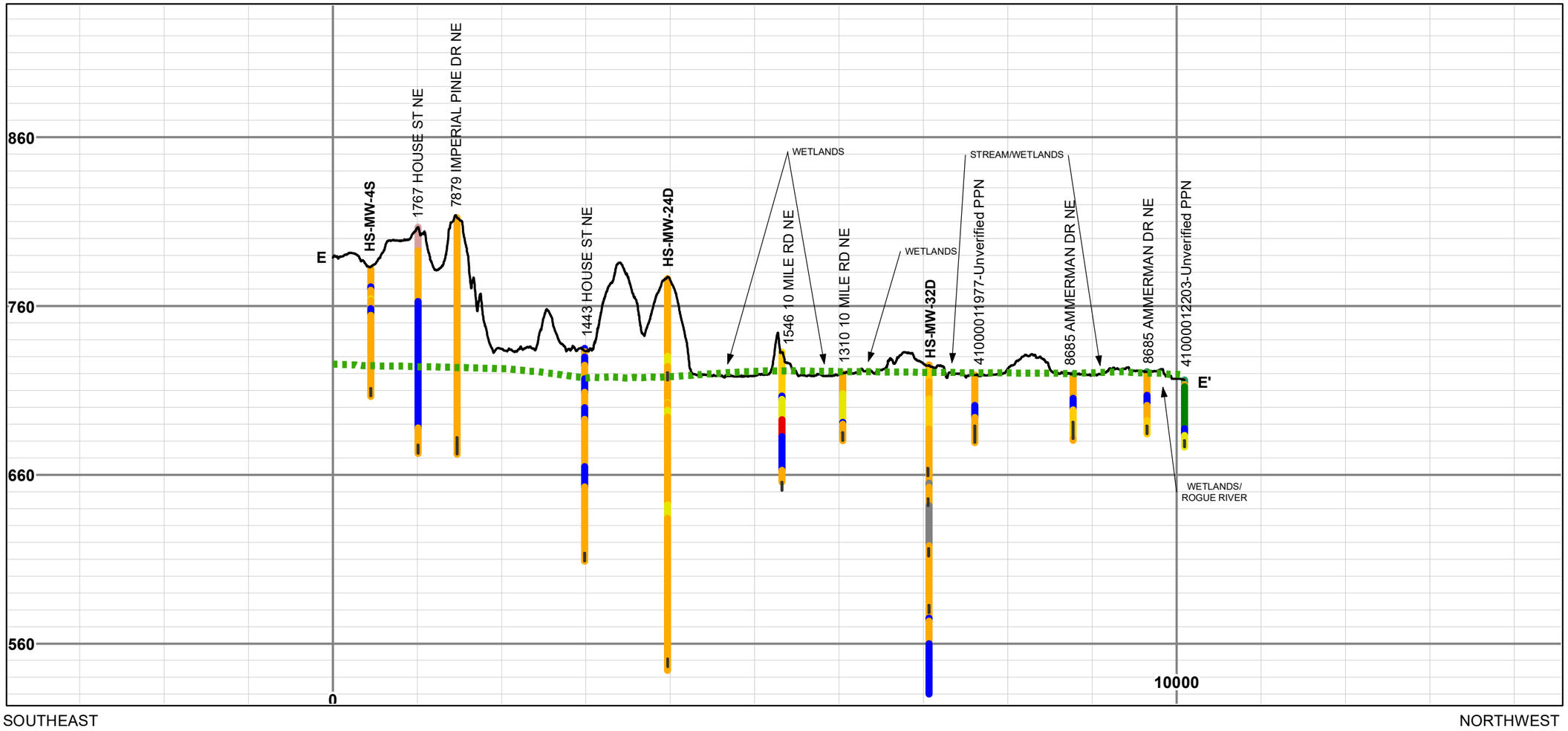
**NORTH KENT STUDY AREA**
**CROSS SECTION D-D'**
**GSI INVESTIGATION**

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

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LJP | REVIEWED BY: MW | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | SCALE: 1 in = 2,000 ft | 7 |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | REVISION NO: | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\jobs\WWW\GSI_F07_SectionD.mxd September 17, 2020 - 12:28:39 PM, julie.groenleer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE
- GRAVEL
- SAND AND
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY
- TOP SOIL
- ORGANIC SOIL
- NOT AVAILABLE

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL

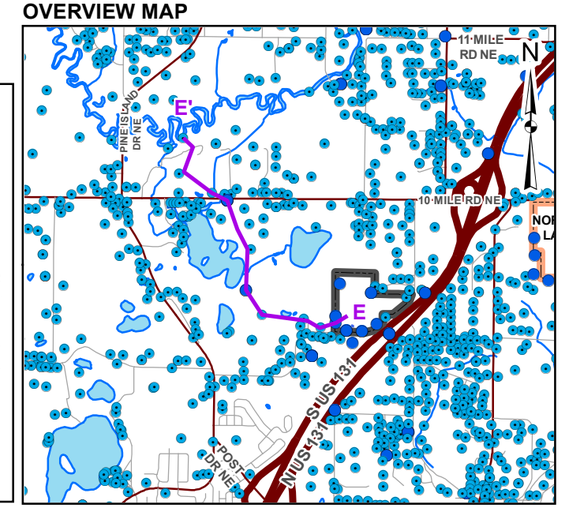
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 2,500 5,000 10,000
SCALE IN FEET

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

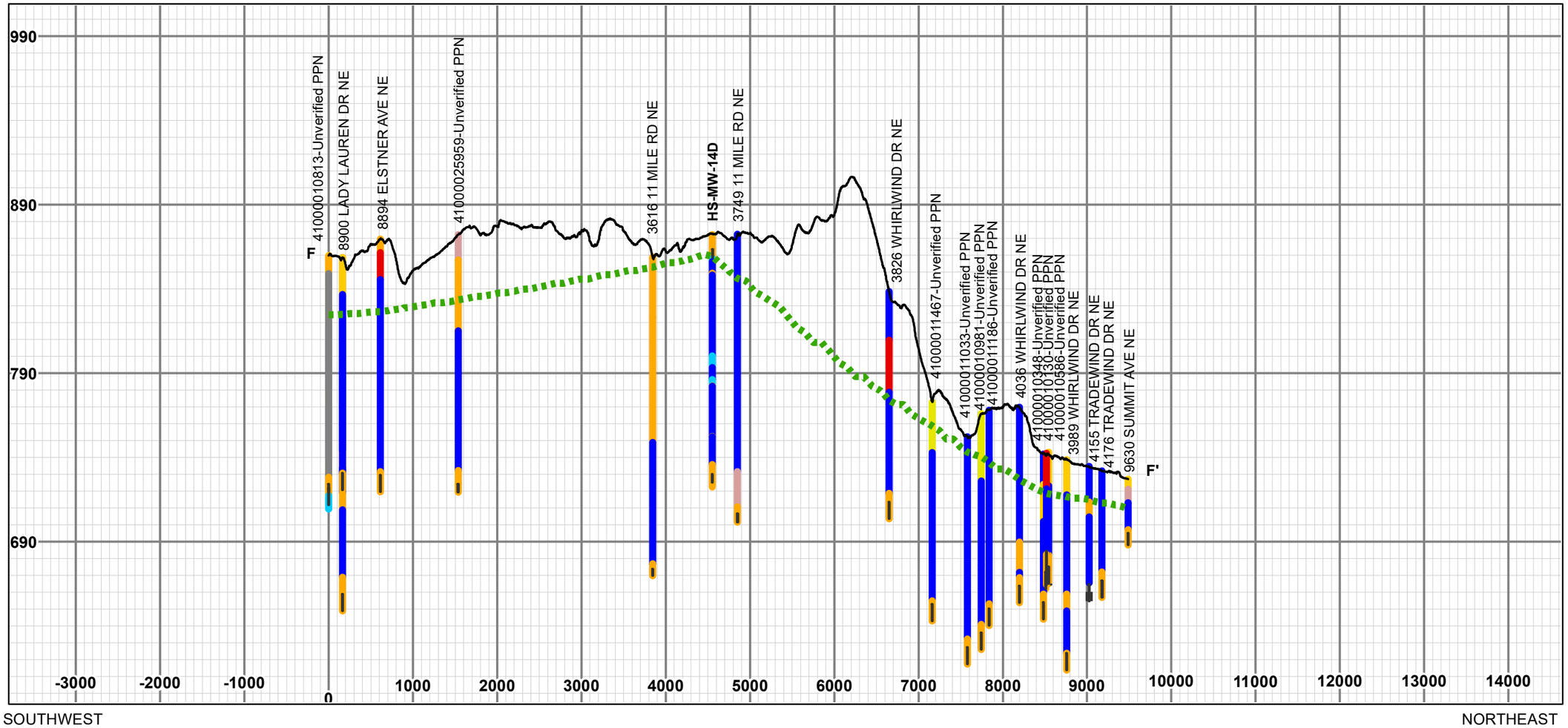
**NORTH KENT STUDY AREA**
**CROSS SECTION E-E'**
**GSI INVESTIGATION**

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

PREPARED FOR:
WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LJP | REVIEWED BY: MW | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | SCALE: 1 in = 5,000 ft | |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | REVISION NO: | 8 |

© 2020 - GZA GeoEnvironmental, Inc. \\gzailvonia\jobs\WWW\GSI_F08_SectionE.mxd, September 17, 2020 - 1:10:22 PM, julie.groenleer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE
- GRAVEL
- SAND AND GRAVEL
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY AND SILT
- CLAY
- NOT AVAILABLE

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- NORTH KENT LANDFILL

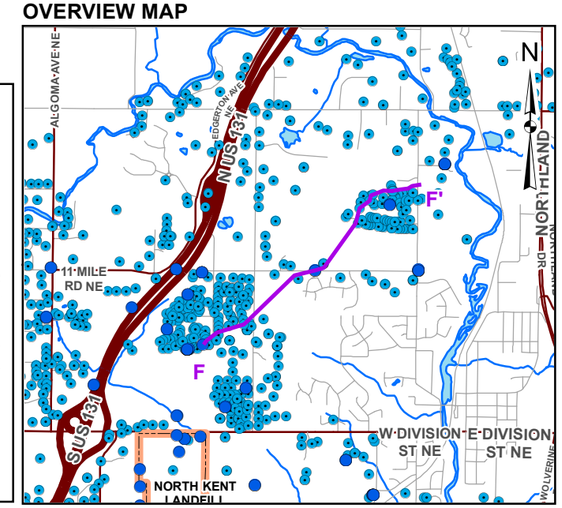
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 2,500 5,000 10,000
SCALE IN FEET

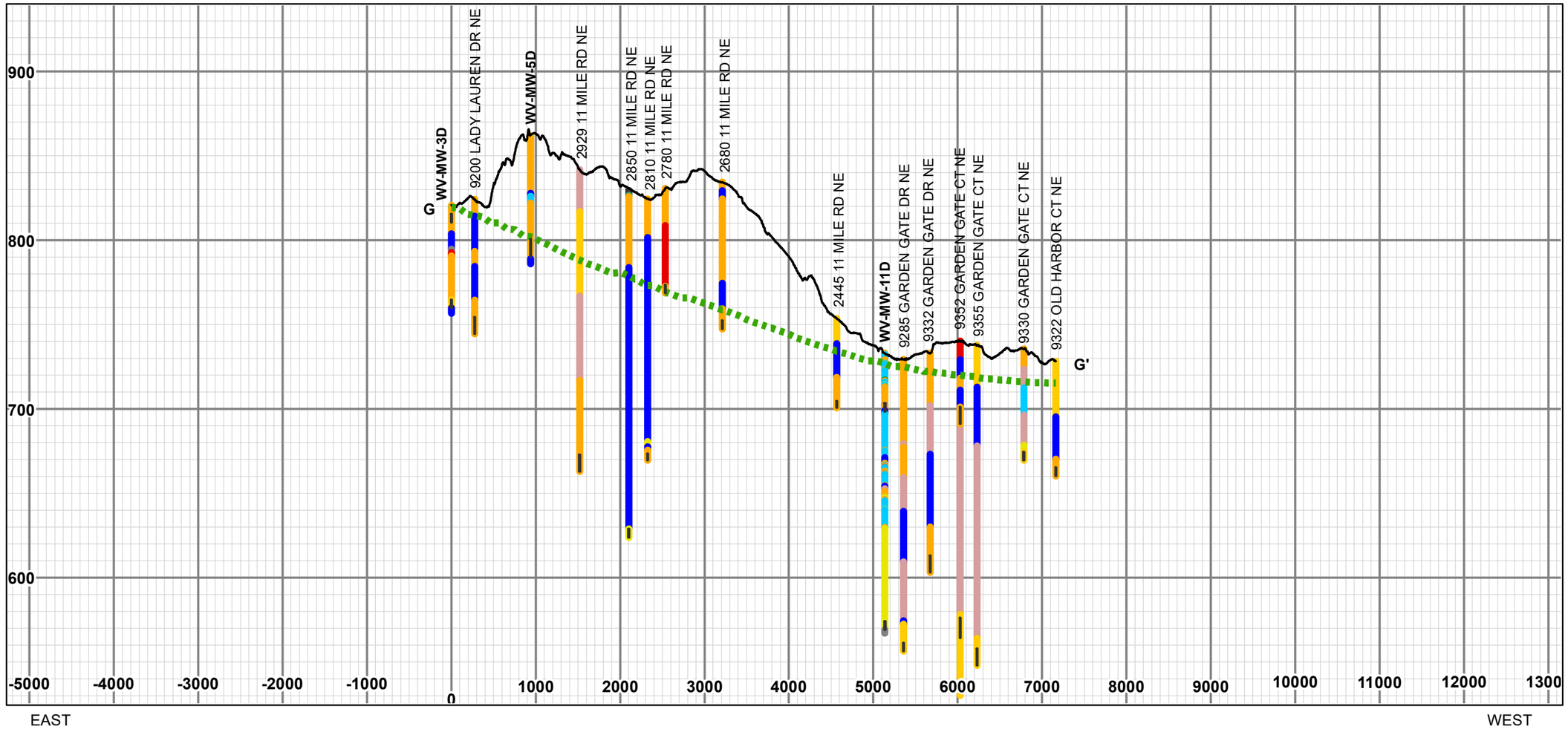
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

**NORTH KENT STUDY AREA**
**CROSS SECTION F-F'**
**GSI INVESTIGATION**

| | | | |
|---|---|---|---|
| PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com | | PREPARED FOR: WN&J/WWW | |
| PROJ MGR: LJP | REVIEWED BY: MW | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | SCALE: 1 in = 5,000 ft | 9 |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | REVISION NO: | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\jobs\WWW\GSI_F09_SectionF.mxd, September 17, 2020 - 3:57:42 PM, julie.groenteer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE
- GRAVEL
- SAND AND
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY AND SILT
- CLAY
- TOP SOIL
- ORGANIC SOIL
- NOT AVAILABLE

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- NORTH KENT LANDFILL

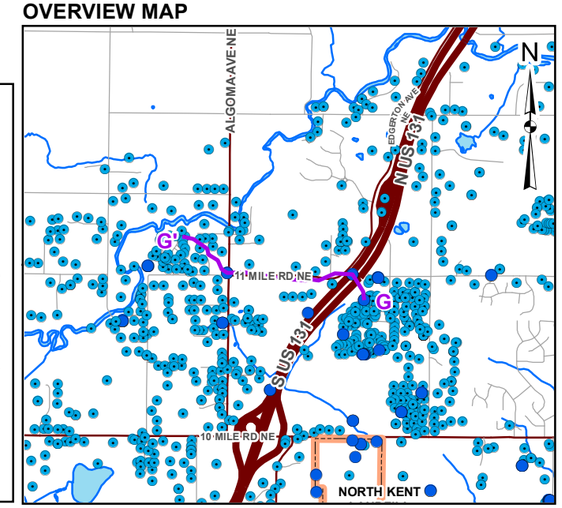
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 2,500 5,000 10,000
SCALE IN FEET

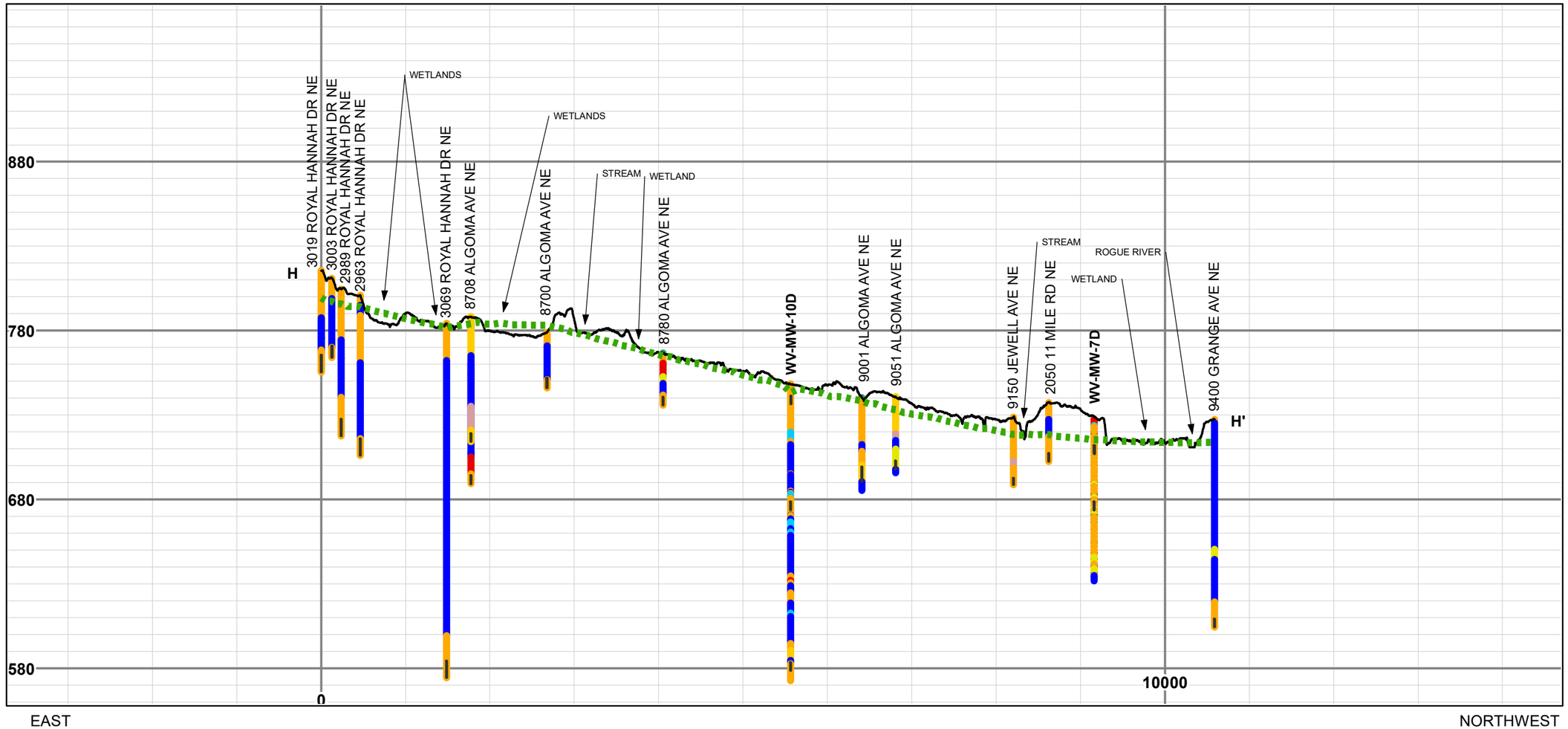
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

**NORTH KENT STUDY AREA**
**CROSS SECTION G-G'**
**GSI INVESTIGATION**

| | | | |
|---|---|---|---|
| PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com | | | PREPARED FOR: WN&J/WWW |
| PROJ MGR: LJP | REVIEWED BY: MW | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | SCALE: 1 in = 5,000 ft | |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | REVISION NO: | 10 |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\obs\WWWGSI F10_SectionG.mxd, September 17, 2020 - 5:09:45 PM, julie.groenleer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE
- GRAVEL
- SAND AND
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- CLAY AND SILT
- CLAY
- TOP SOIL
- NOT AVAILABLE

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL

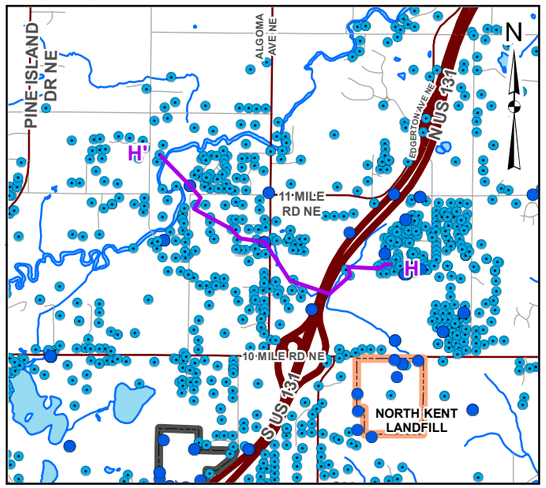
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 2,500 5,000 10,000
SCALE IN FEET

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

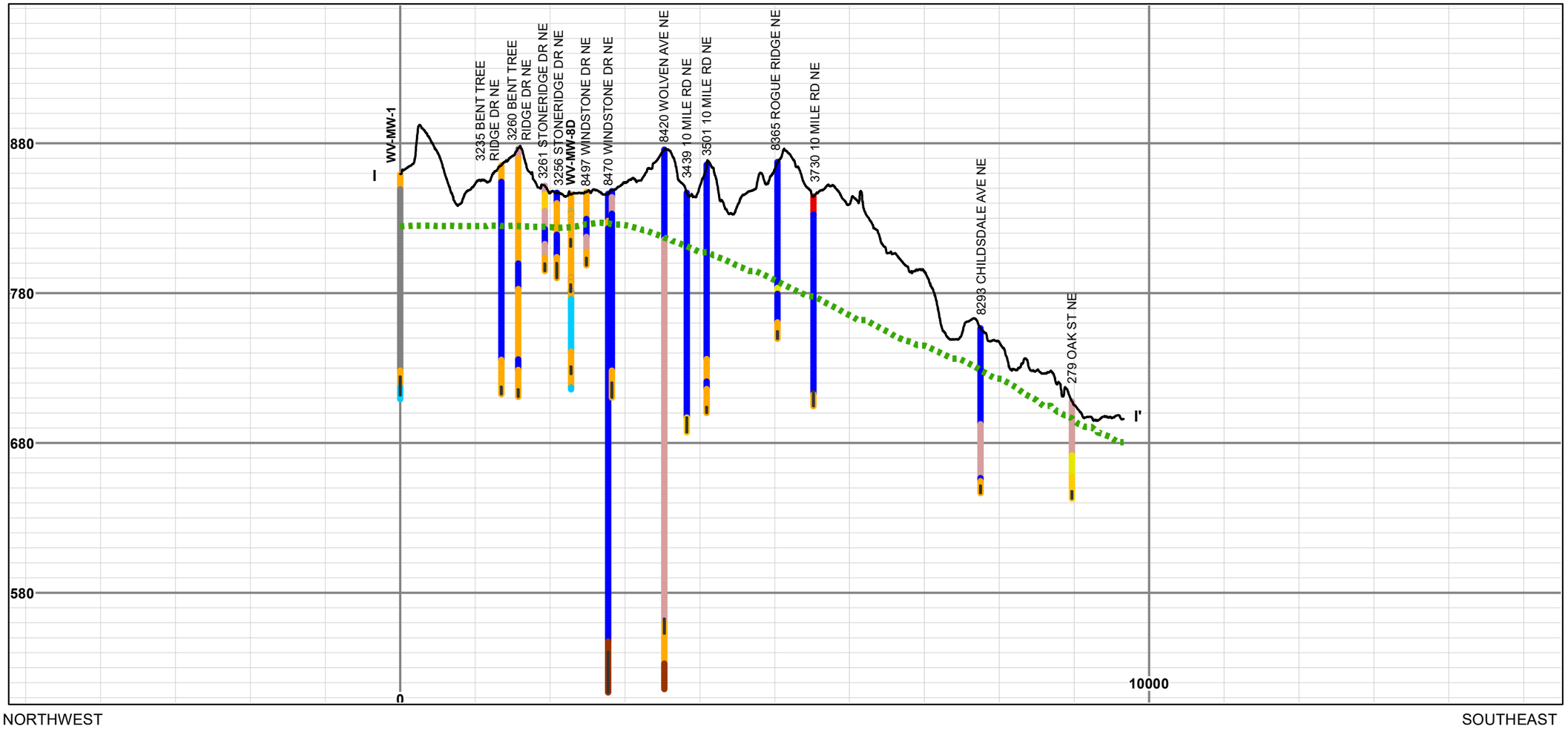
**NORTH KENT STUDY AREA**
**CROSS SECTION H-H'**
**GSI INVESTIGATION**

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

PREPARED FOR:
WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LJP | REVIEWED BY: MW | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | SCALE: 1 in = 5,000 ft | 11 |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | REVISION NO: | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\jobs\WWW\GSI F11_SectionH.mxd September 17, 2020 - 5:52:18 PM julie.groenteer




## CROSS SECTION LEGEND

- WELL SCREEN
- ESTIMATED GROUNDWATER TABLE (11/2019)
- GROUND SURFACE
- GRAVEL
- SAND AND GRAVEL
- SAND
- SAND/GRAVEL WITH CLAY/SILT
- CLAY/SILT WITH SAND/GRAVEL
- SILT
- CLAY AND SILT
- CLAY
- BEDROCK

## OVERVIEW MAP LEGEND

- RESIDENTIAL WATER WELL
- MONITORING WELL
- CROSS SECTION LINE
- HIGHWAY
- PRIMARY COUNTY ROAD
- OTHER ROAD
- RIVER OR STREAM
- SURFACE WATER
- APPROXIMATE HOUSE ST. DISPOSAL SITE BOUNDARY
- NORTH KENT LANDFILL

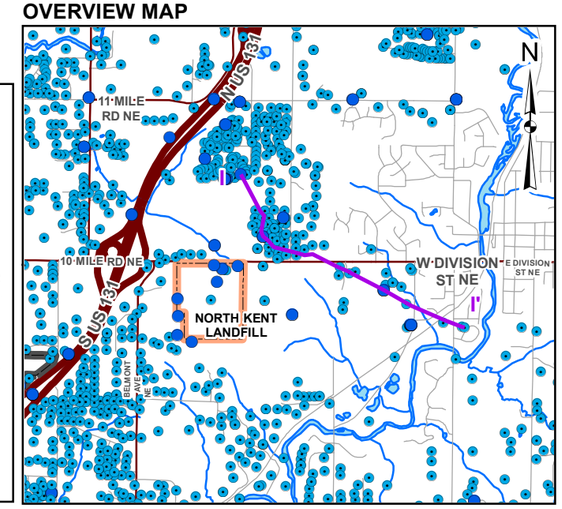
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. GROUND SURFACE ELEVATIONS ARE BASED ON DIGITAL RASTER FILES OF BARE EARTH DIGITAL ELEVATION MODELS (DEMS), GENERATED FROM LIDAR DATA WITH 1-METER HORIZONTAL ACCURACY AND 18.5-CENTIMETER VERTICAL ACCURACY. DIGITAL FILES OF DEMS AND LIDAR DATA WERE PROVIDED BY KENT COUNTY.

3. ESTIMATED GROUNDWATER TABLE WAS DEVELOPED BASED ON MEASUREMENTS MADE IN GROUNDWATER MONITORING WELLS IN NOVEMBER 2019. GROUNDWATER ELEVATIONS WERE NOT MEASURED FROM RESIDENTIAL WATER SUPPLY WELLS.

4. WELL SCREEN ELEVATIONS PROVIDED IN FEET ABOVE MEAN SEA LEVEL, NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). RESIDENTIAL WELL SCREEN ELEVATIONS AND BOREHOLE LITHOLOGY ELEVATIONS WERE CALCULATED USING WELL INFORMATION PROVIDED BY THE STATE OF MICHIGAN'S WELLOGIC DATABASE AND GROUND SURFACE ELEVATIONS OF THE CENTER OF THE PPN GENERATED FROM LIDAR DATA PROVIDED BY KENT COUNTY. ELEVATIONS ARE ROUNDED TO THE NEAREST FOOT.

## OVERVIEW MAP




0 2,500 5,000 10,000
SCALE IN FEET

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

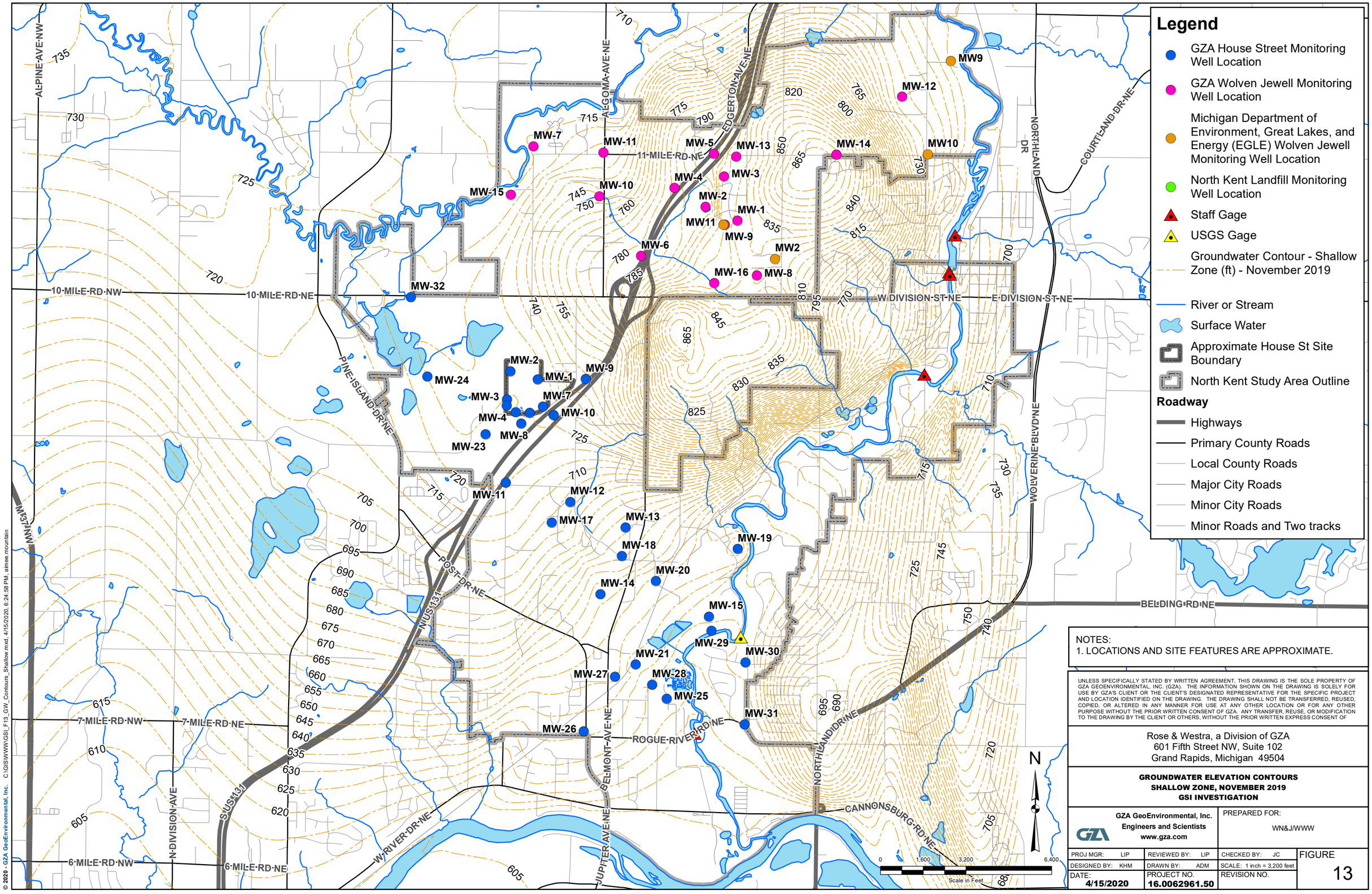
**NORTH KENT STUDY AREA**
**CROSS SECTION I-I'**
**GSI INVESTIGATION**

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

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LJP | REVIEWED BY: MW | CHECKED BY: LMN | FIGURE |
| DESIGNED BY: JC | DRAWN BY: JMG | SCALE: 1 in = 5,000 ft | 12 |
| DATE: 09/17/2020 | PROJECT NO: 16.0062961.50 | REVISION NO: | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\jobs\WWW\GSI F12_Section1.mxd, September 17, 2020 - 7:14:57 PM, julie.groenleer




NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

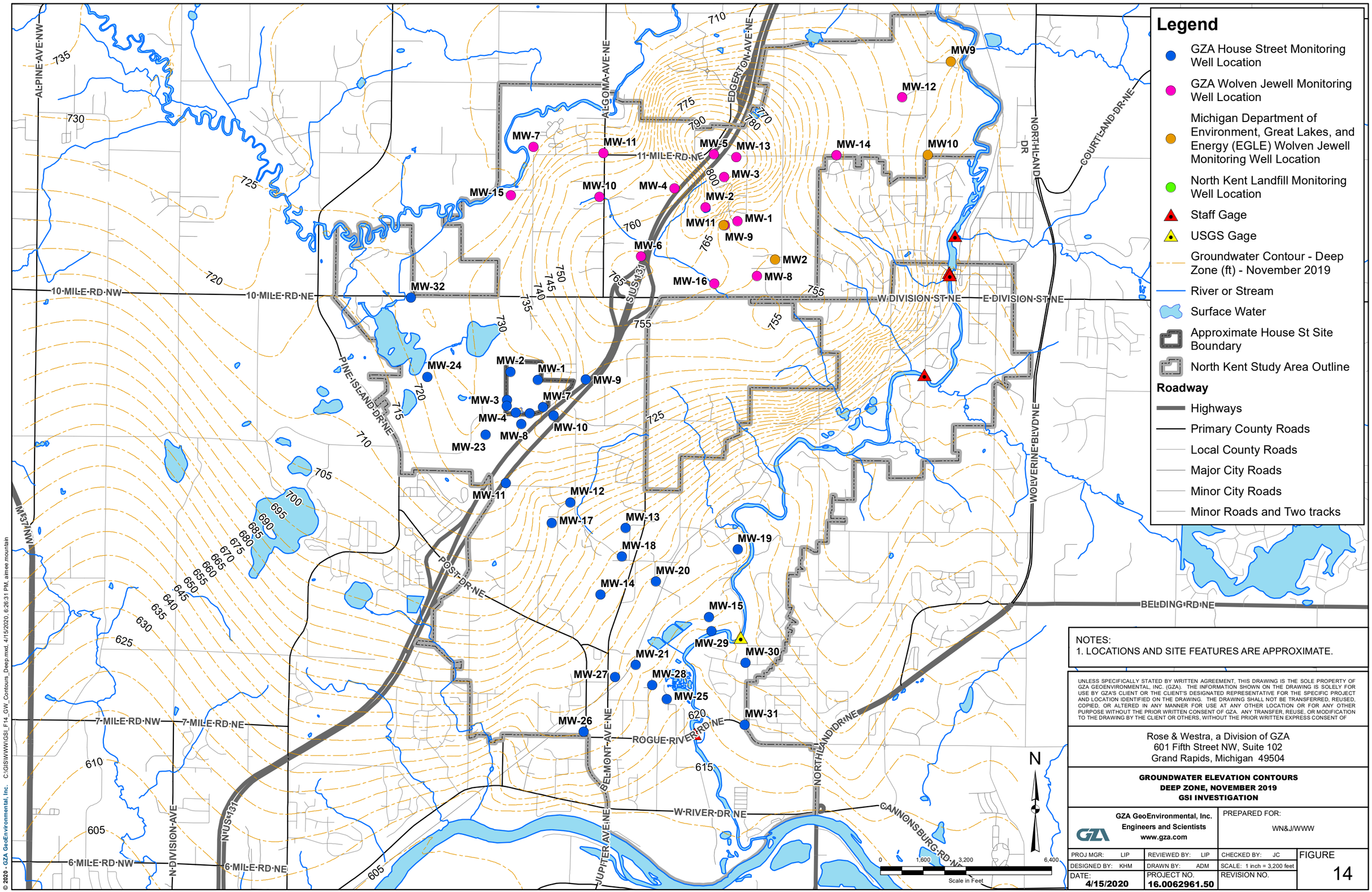
**GROUNDWATER ELEVATION CONTOURS**
**SHALLOW ZONE, NOVEMBER 2019**
**GSI INVESTIGATION**

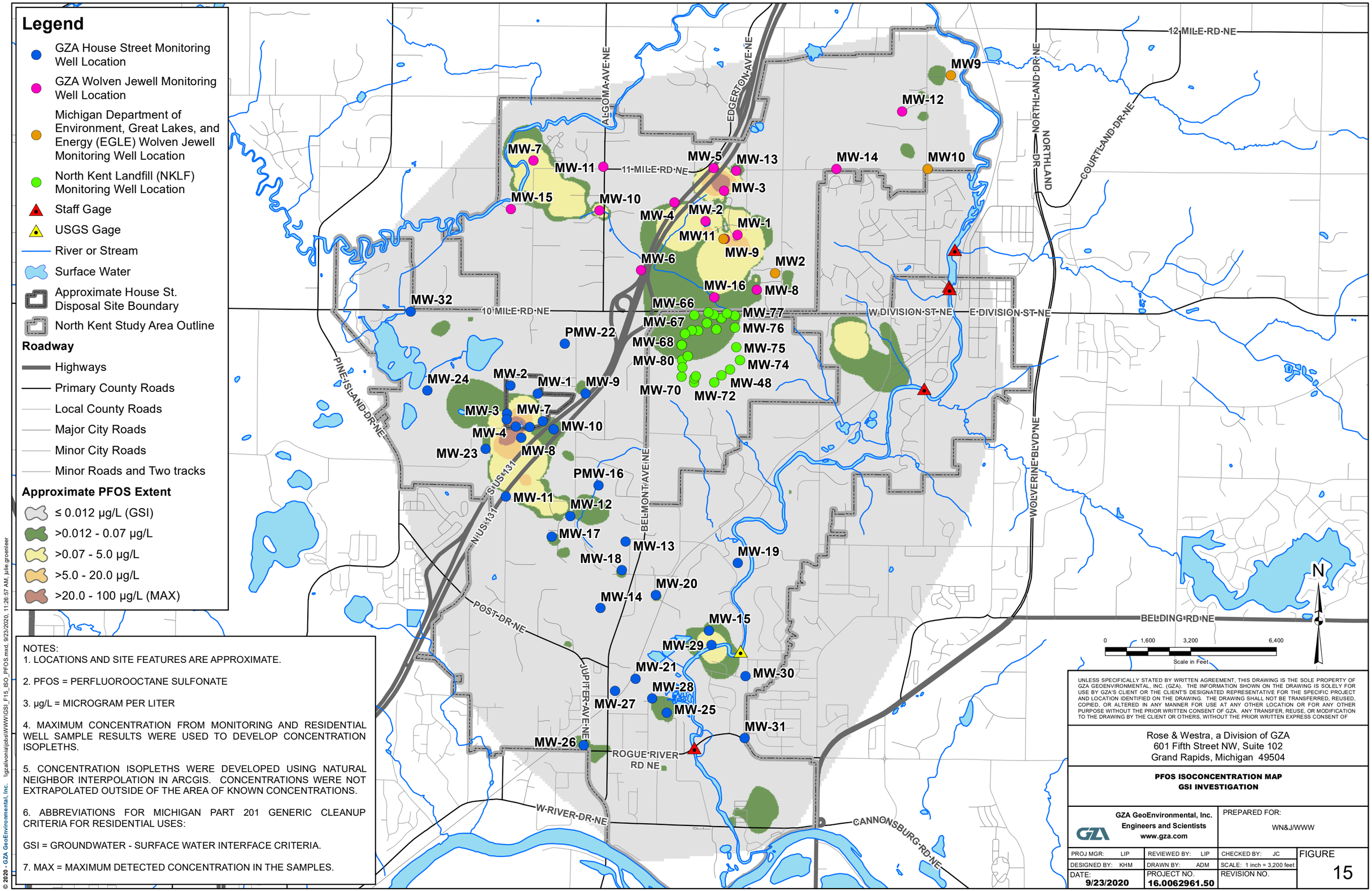
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 3,200 feet | 13 |
| DATE: 4/15/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. C:\GIS\WWW\GSI_F13_GW_Contours_Shallow.mxd, 4/15/2020, 6:24:58 PM, aimee.mountain


Legend
GZA House Street Monitoring Well Location
GZA Wolven Jewell Monitoring Well Location
Michigan Department of Environment, Great Lakes, and Energy (EGLE) Wolven Jewell Monitoring Well Location
North Kent Landfill Monitoring Well Location
Staff Gage
USGS Gage
Groundwater Contour - Deep Zone (ft) - November 2019
River or Stream
Surface Water
Approximate House St Site Boundary
North Kent Study Area Outline
Roadway
Highways
Primary County Roads
Local County Roads
Major City Roads
Minor City Roads
Minor Roads and Two tracks
NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.
UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF
Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504
GROUNDWATER ELEVATION CONTOURS
DEEP ZONE, NOVEMBER 2019
GSI INVESTIGATION
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com
PREPARED FOR:
WN&J/WWW
PROJ MGR: LIP
REVIEWED BY: LIP
CHECKED BY: JC
DESIGNED BY: KHM
DRAWN BY: ADM
SCALE: 1 inch = 3,200 feet
DATE: 4/15/2020
PROJECT NO. 16.0062961.50
REVISION NO.
FIGURE 14
N
0 1,600 3,200 6,400
Scale in Feet
ALPINE AVE NW
10 MILE RD NW
10 MILE RD NE
7 MILE RD NW
7 MILE RD NE
6 MILE RD NW
6 MILE RD NE
M37 NW
N DIVISION AVE
PINE ISLAND DR NE
ALGOMA AVE NE
11 MILE RD NE
EDGERTON AVE NE
US 131
POST DR NE
BELMONT AVE NE
JUPITER AVE NE
ROGUE RIVER RD NE
W RIVER DR NE
NORTHLAND DR NE
CANNONSBURG RD NE
W DIVISION ST NE
E DIVISION ST NE
WOLVERINE BLVD NE
BELDING RD NE
COURTLAND DR NE
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17
MW-18
MW-19
MW-20
MW-21
MW-23
MW-24
MW-25
MW-26
MW-27
MW-28
MW-29
MW-30
MW-31
MW-32
MW1
MW2
MW9
MW10
MW11
© 2020 - GZA GeoEnvironmental, Inc. C:\GIS\WWW\GSI_F14_GW_Contours_Deep.mxd, 4/15/2020, 6:26:31 PM, aimee.mountain




NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. PFOS = PERFLUOROOCTANE SULFONATE

3. µg/L = MICROGRAM PER LITER

4. MAXIMUM CONCENTRATION FROM MONITORING AND RESIDENTIAL WELL SAMPLE RESULTS WERE USED TO DEVELOP CONCENTRATION ISOPLETHS.

5. CONCENTRATION ISOPLETHS WERE DEVELOPED USING NATURAL NEIGHBOR INTERPOLATION IN ARCGIS. CONCENTRATIONS WERE NOT EXTRAPOLATED OUTSIDE OF THE AREA OF KNOWN CONCENTRATIONS.

6. ABBREVIATIONS FOR MICHIGAN PART 201 GENERIC CLEANUP CRITERIA FOR RESIDENTIAL USES:

GSI = GROUNDWATER - SURFACE WATER INTERFACE CRITERIA.

7. MAX = MAXIMUM DETECTED CONCENTRATION IN THE SAMPLES.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

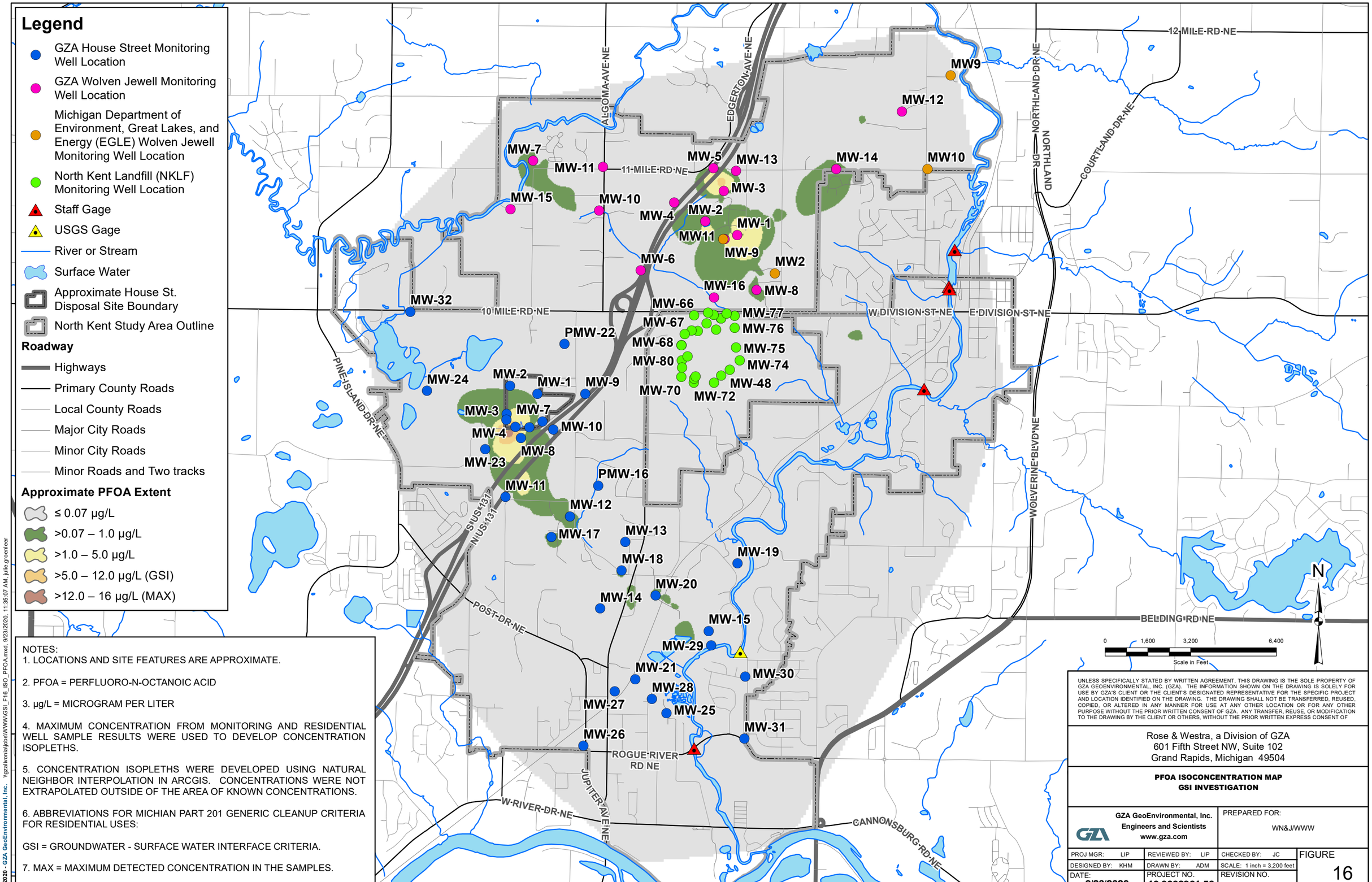
**PFOS ISOCONCENTRATION MAP**
**GSI INVESTIGATION**

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 3,200 feet | 15 |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzaitvonia\jobs\WWW\GSI_F15_ISO_PFOS.mxd, 9/23/2020, 11:26:57 AM, julie.groenleer




NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. PFOA = PERFLUORO-N-OCTANOIC ACID

3. µg/L = MICROGRAM PER LITER

4. MAXIMUM CONCENTRATION FROM MONITORING AND RESIDENTIAL WELL SAMPLE RESULTS WERE USED TO DEVELOP CONCENTRATION ISOPLETHS.

5. CONCENTRATION ISOPLETHS WERE DEVELOPED USING NATURAL NEIGHBOR INTERPOLATION IN ARCGIS. CONCENTRATIONS WERE NOT EXTRAPOLATED OUTSIDE OF THE AREA OF KNOWN CONCENTRATIONS.

6. ABBREVIATIONS FOR MICHIAN PART 201 GENERIC CLEANUP CRITERIA FOR RESIDENTIAL USES:

GSI = GROUNDWATER - SURFACE WATER INTERFACE CRITERIA.

7. MAX = MAXIMUM DETECTED CONCENTRATION IN THE SAMPLES.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

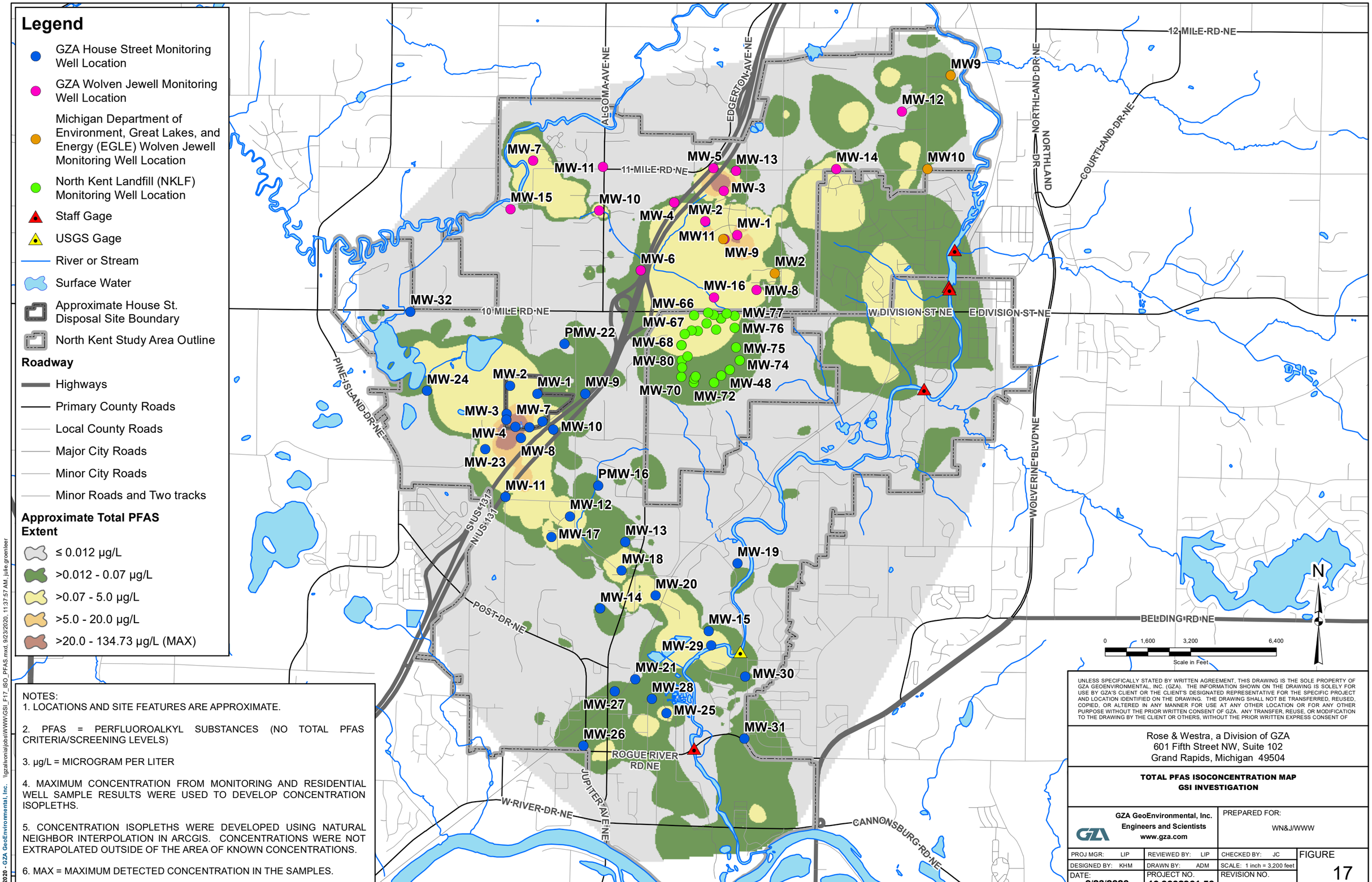
**PFOA ISOCONCENTRATION MAP**
**GSI INVESTIGATION**

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 3,200 feet | 16 |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzaitvonia\jobs\WWW\GSI_F16_ISO_PFOA.mxd, 9/23/2020, 11:35:07 AM, julie.groenleer




NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. PFAS = PERFLUOROALKYL SUBSTANCES (NO TOTAL PFAS CRITERIA/SCREENING LEVELS)

3. µg/L = MICROGRAM PER LITER

4. MAXIMUM CONCENTRATION FROM MONITORING AND RESIDENTIAL WELL SAMPLE RESULTS WERE USED TO DEVELOP CONCENTRATION ISOPLETHS.

5. CONCENTRATION ISOPLETHS WERE DEVELOPED USING NATURAL NEIGHBOR INTERPOLATION IN ARCGIS. CONCENTRATIONS WERE NOT EXTRAPOLATED OUTSIDE OF THE AREA OF KNOWN CONCENTRATIONS.

6. MAX = MAXIMUM DETECTED CONCENTRATION IN THE SAMPLES.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

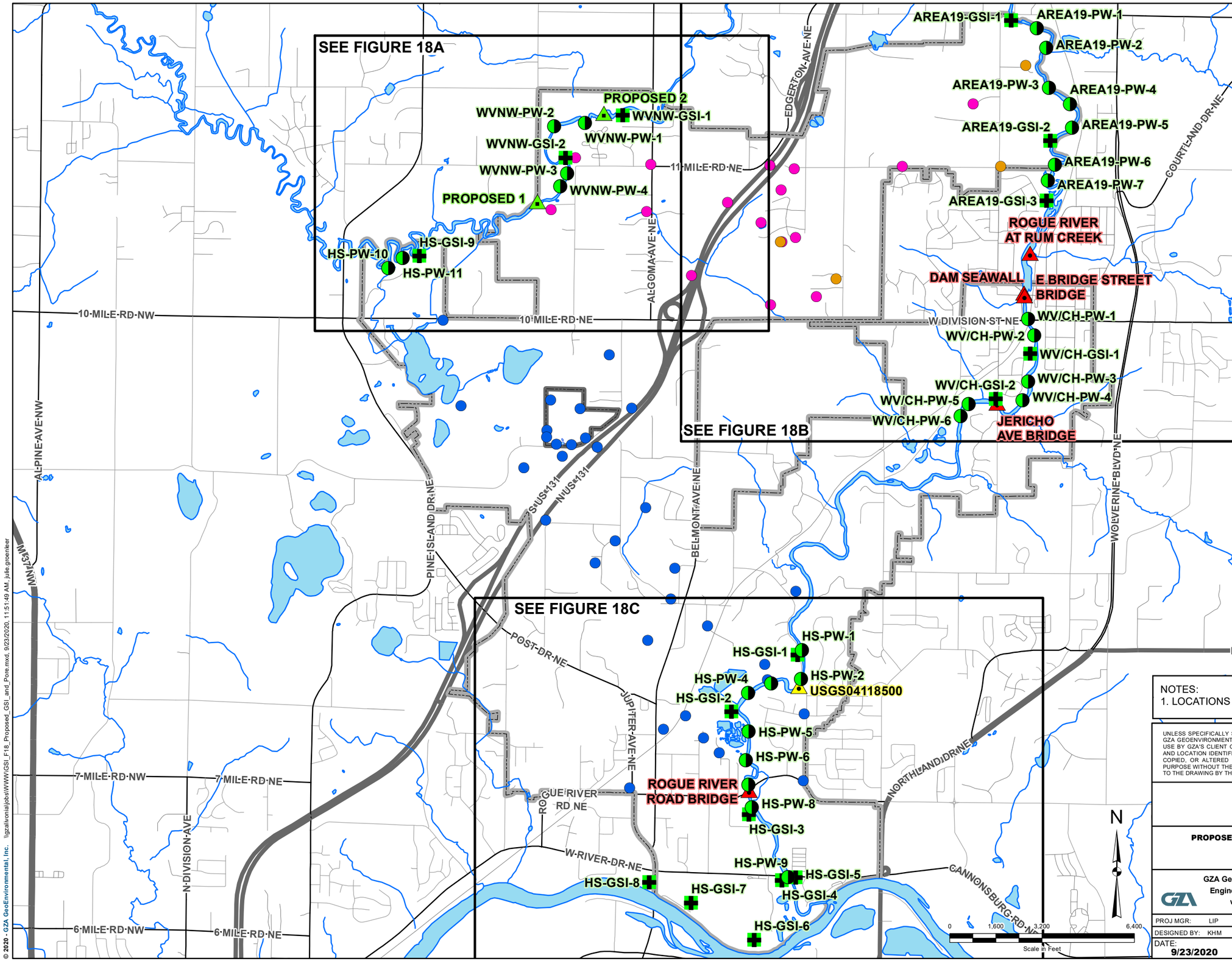
**TOTAL PFAS ISOCONCENTRATION MAP**
**GSI INVESTIGATION**

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 3,200 feet | 17 |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzaitvonia\jobs\WWW\GSI_F17_ISO_PFAS.mxd, 9/23/2020, 11:37:57 AM, julie.groenleer




## Legend

- Proposed GSI Piezometer Location
- Proposed Pore Water Sampling Location
- GZA House Street Monitoring Well Location
- GZA Wolven Jewell Monitoring Well Location
- Michigan Department of Environment, Great Lakes, and Energy (EGLE) Wolven Jewell Monitoring Well Location
- North Kent Landfill Monitoring Well Location
- Proposed Staff Gauge
- Staff Gauge
- USGS Gauge
- River or Stream
- Surface Water
- Approximate House St. Disposal Site Boundary
- North Kent Study Area Outline

**Roadway**

- Highways
- Primary County Roads
- Local County Roads
- Major City Roads
- Minor City Roads
- Minor Roads and Two tracks

NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

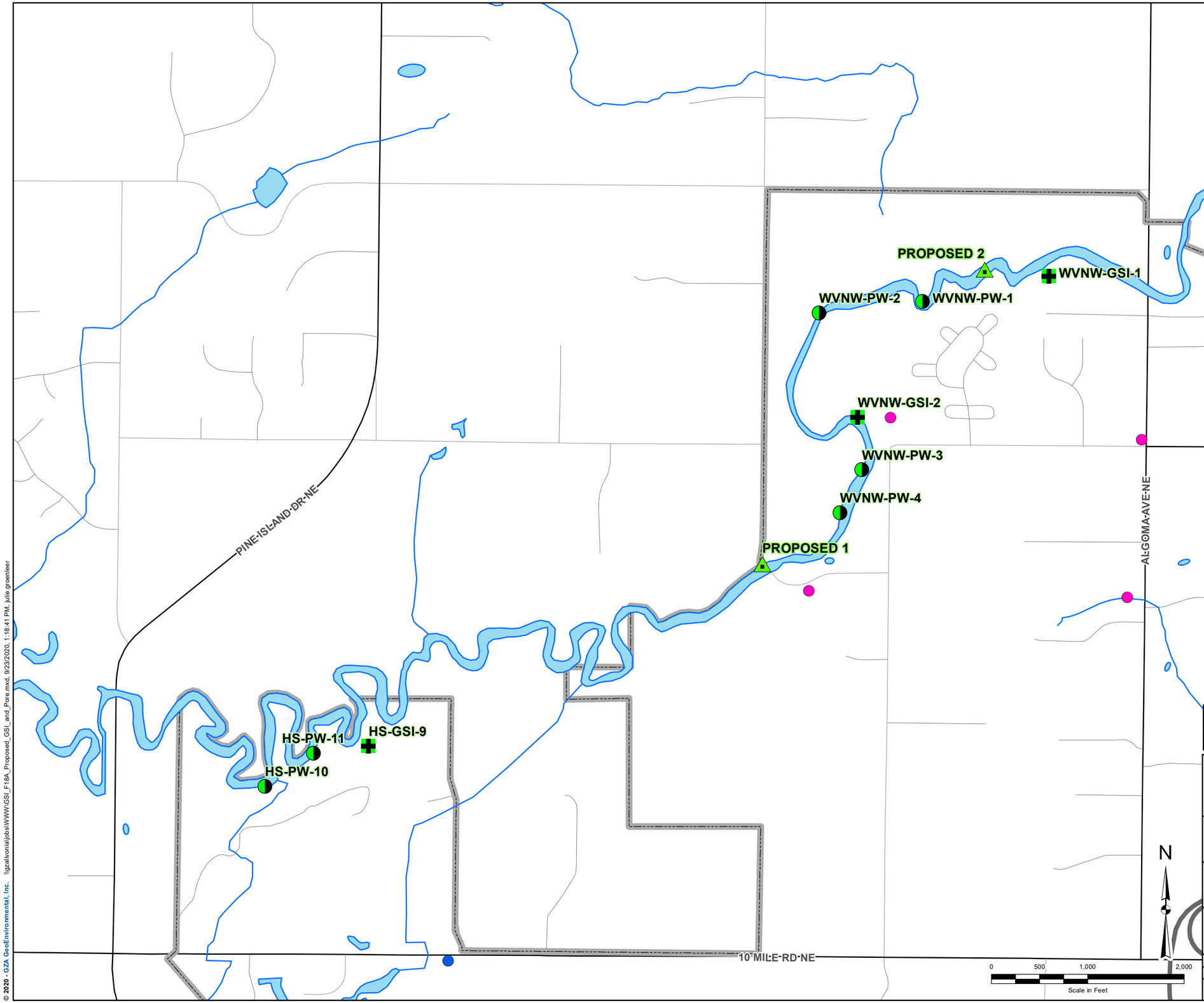
**PROPOSED GSI AND PORE WATER SAMPLING LOCATIONS**
**OVERVIEW**
**GSI INVESTIGATION**

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 3,200 feet | 18 |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalivonia\jobs\WWW\GSI_F18_Proposed_GSI_and_Pore.mxd, 9/23/2020, 11:51:49 AM, julie.groenleer




## Legend

- Proposed GSI Piezometer Location
- Proposed Pore Water Sampling Location
- GZA House Street Monitoring Well Location
- GZA Wolven Jewell Monitoring Well Location
- Proposed Staff Gauge
- River or Stream
- Surface Water
- North Kent Study Area Outline

**Roadway**

- Highways
- Primary County Roads
- Local County Roads
- Minor Roads and Two tracks

NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

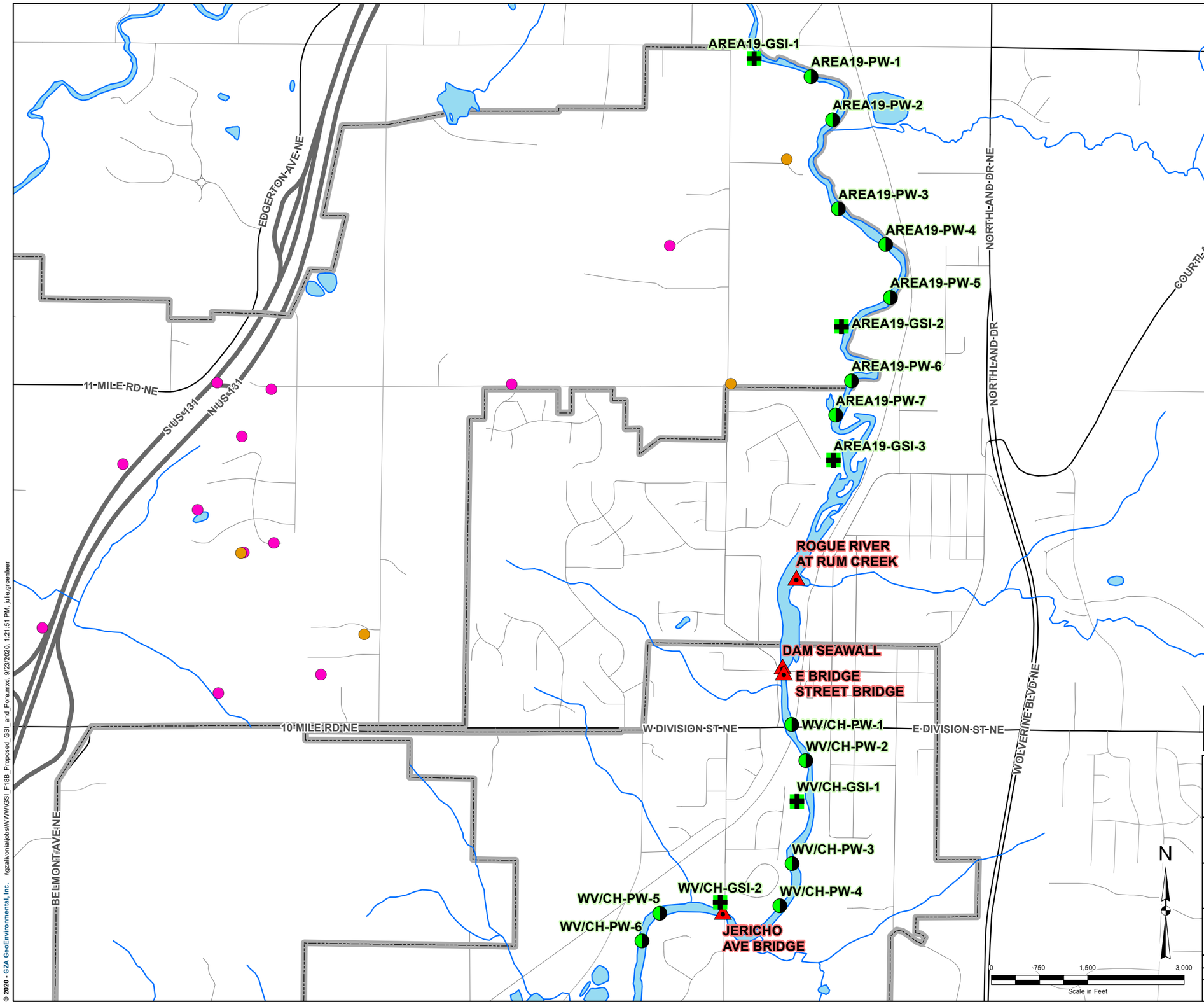
**PROPOSED GSI AND PORE WATER SAMPLING LOCATIONS**
**WOLVEN NORTHWEST AREA**
**GSI INVESTIGATION**

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 1,000 feet | 18A |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzailvonia\jobs\WWW\GSI_F18A_Proposed_GSI_and_Pore.mxd, 9/23/2020, 1:18:41 PM, julie.groenleer




## Legend

- Proposed GSI Piezometer Location
- Proposed Pore Water Sampling Location
- GZA Wolven Jewell Monitoring Well Location
- Michigan Department of Environment, Great Lakes, and Energy (EGLE) Wolven Jewell Monitoring Well Location
- Staff Gauge
- River or Stream
- Surface Water
- North Kent Study Area Outline

**Roadway**

- Highways
- Primary County Roads
- Local County Roads
- Major City Roads
- Minor City Roads
- Minor Roads and Two tracks

NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

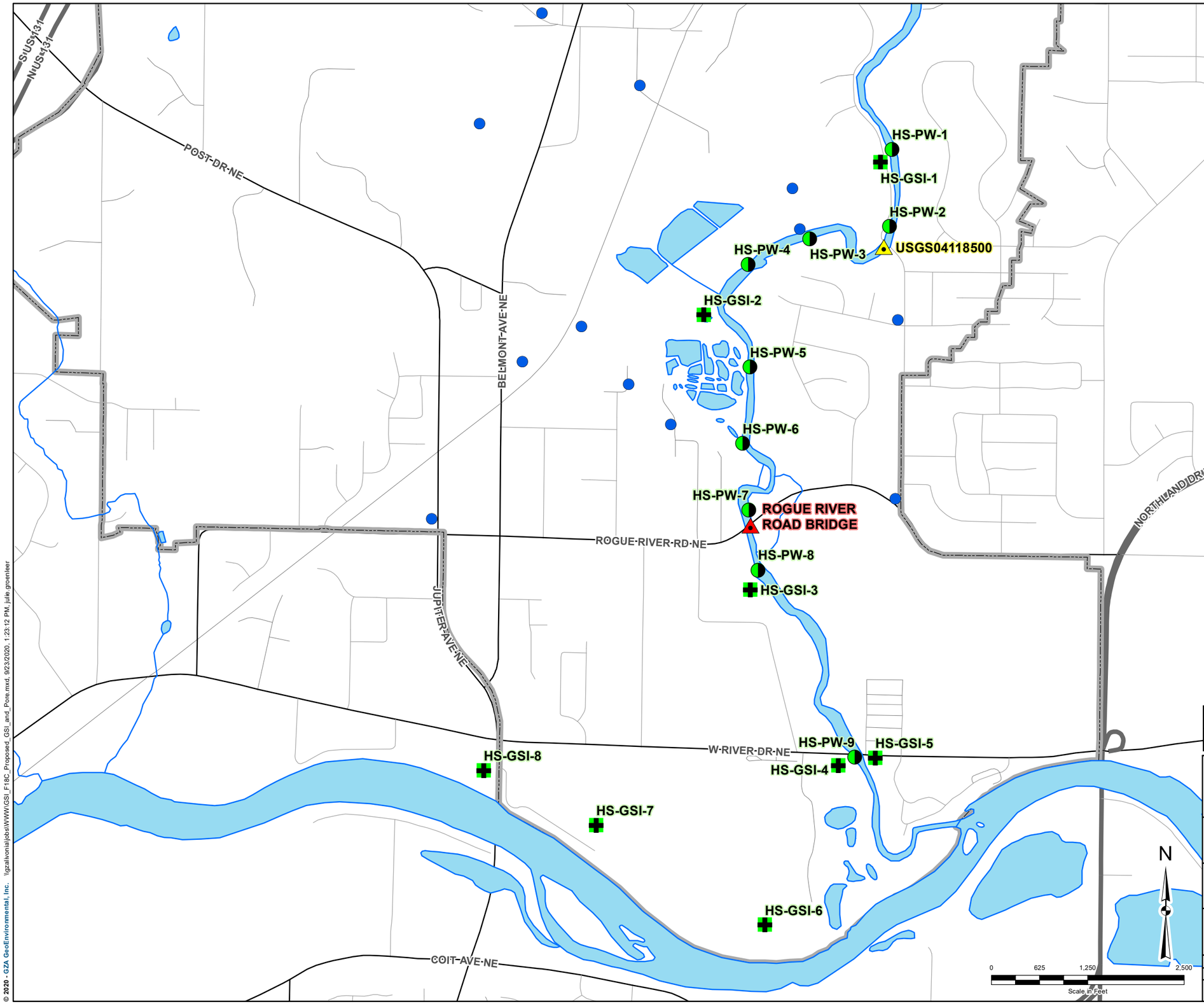
**PROPOSED GSI AND PORE WATER SAMPLING LOCATIONS**
**AREA 19 AND WOLVEN NORTHEAST AREA**
**GSI INVESTIGATION**

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 1,500 feet | 18B |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzalvonia\jobs\WWW\GSI_F18B_Proposed_GSI_and_Pore.mxd, 9/23/2020, 1:21:51 PM, julie.groenleer




NOTES:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

**PROPOSED GSI AND PORE WATER SAMPLING LOCATIONS**
**AREAS 11 & 12**
**GSI INVESTIGATION**

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

| | | | |
|---|---|---|---|
| PROJ MGR: LIP | REVIEWED BY: LIP | CHECKED BY: JC | FIGURE |
| DESIGNED BY: KHM | DRAWN BY: ADM | SCALE: 1 inch = 1,250 feet | 18C |
| DATE: 9/23/2020 | PROJECT NO. 16.0062961.50 | REVISION NO. | |

© 2020 - GZA GeoEnvironmental, Inc. \\gzaitvonia\jobs\WWW\GSI_F18C_Proposed_GSI_and_Pore.mxd, 9/23/2020, 1:23:12 PM, julie.groenleer

# APPENDIX A – GROUNDWATER MONITORING WELL INSTALLATION LOGS, SOIL BORING LOGS

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 1 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-5-17 / 9-5-17
**Boring Location:**
**GS Elev.:** 788.80' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

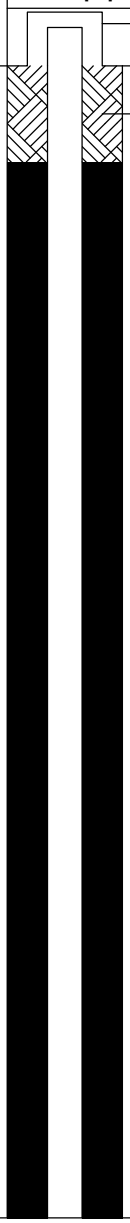
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/20 | 0-2 | 3-4 4-7 | | Yellowish-brown to brown, SILT, some fine grained Sand, trace Gravel, poorly sorted, dry (ML). | SILT (ML) | |
| 1 | | | | | | | | |
| 2 | 2 | 24/22 | 2-4 | 4-5 8-9 | | Yellowish-brown to brown, SILT, some fine grained Sand, trace Gravel, poorly sorted, dry (ML). Changing at 2.6 feet to: Yellowish-brown, fine to medium SAND, little Silt, moderately sorted, dry (SM). Changing at 2.7 feet to: Mottled dark yellowish-brown to light grayish-brown, SILT, little Clay, little Sand, trace Gravel, poorly sorted, dry (ML). | 2.6' 2.7' SAND (SM) SILT (ML) | |
| 3 | | | | | | | | |
| 4 | 3 | 24/24 | 4-6 | 8-6 7-7 | | Yellowish-red to dark brown, medium to fine grained SAND, some Silt, trace Gravel, moderate sorting, dry (SM). Changing at 4.5 feet to: Mottled dark yellowish-brown to light gray, SILT, little Clay, little fine to medium grained Sand, slightly plastic, cohesive, poorly sorted, dry (ML). | 4' SAND (SM) 4.5' SILT (ML) | |
| 5 | | | | | | | | |
| 6 | 4 | 24/24 | 6-8 | 3-4 5-5 | | Mottled dark yellowish-brown to light gray, SILT, little Clay, little fine to medium grained Sand, slightly plastic, cohesive, poorly sorted, dry (ML). Changing at 7.1 feet to: Mottled grayish-brown to dark yellowish-brown, CLAY & SILT, plastic, cohesive, moist (CL). | 7.1' CLAY & SILT (CL) | |
| 7 | | | | | | | | |
| 8 | 5 | 24 | 8-10 | 4-4 3-5 | | Mottled grayish-brown to dark yellowish-brown, CLAY & SILT, plastic, cohesive, moist (CL). | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/20 | 10-12 | 2-4 2-2 | | Mottled grayish-brown to dark yellowish-brown, CLAY & SILT, plastic, cohesive, moist (CL). Changing at 10.4 feet to: Dark gray to dark grayish-brown, fine to medium grained SAND, trace Silt, moderately sorted, moist (SP). Changing at 11.4 feet to: Dark gray to dark grayish-brown, fine to coarse SAND, trace | 10.4' SAND (SP) 11.4' SAND (SW) 12' | |
| 11 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 2 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24/24 | 12-14 | 5-6<br>14-16 | | Gravel, trace Silt, trace Clay, slightly cohesive, poorly sorted, moist to wet (SW). Dark grayish-brown to very dark grayish-brown, CLAY & SILT, trace Gravel, plastic, cohesive, poorly sorted, moist (CL). Changing at 13.6 feet to: Grayish-brown, coarse to medium SAND, trace Gravel, trace Silt, poorly sorted, moist (SP). Changing at 13.7 feet to: Mottled yellowish-brown to light yellowish-brown to dark gray to black, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, poorly sorted, moist (CL). Mottled yellowish-brown to light yellowish-brown to dark gray to black, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, poorly sorted, moist (CL). Changing at 15.0 feet to: Black, fine to coarse grained SAND, trace Gravel, trace Silt, poorly sorted, moist (SW). Changing at 15.1 feet to: Brownish-yellow, SILT, very well sorted, moist to wet (ML). Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 17.3 feet to: Dark yellowish-brown, fine grained SAND, little Clay, little Silt, slightly to moderately plastic, cohesive, moderately sorted, moist (SC). Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 19.0 feet to: Yellowish-brown, fine grained SAND, little Clay, little Silt, moderately plastic, cohesive, moderately sorted, moist (SC). Changing at 19.3 feet to: Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). | CLAY & SILT (CL) | | |
| 13 | | | | | | | 13.6' | | |
| | | | | | | | 13.7' SAND (SP) | | |
| 14 | 8 | 24/24 | 14-16 | 4-12<br>7-7 | | | CLAY & SILT (CL) | | |
| 15 | | | | | | | 15' | | |
| | | | | | | | 15.1 SAND (SW) | | |
| | | | | | | | SILT (ML) | | |
| 16 | 9 | 24/18 | 16-18 | 3-3<br>5-6 | | | 16' | | |
| | | | | | | | SAND (SP) | | |
| 17 | | | | | | | 17.3' | | |
| | | | | | | | SAND (SM) | | |
| 18 | 10 | 24/20 | 18-20 | 2-4<br>7-9 | | | 18' | | |
| | | | | | | | SAND (SP) | | |
| 19 | | | | | | | 19' | | |
| | | | | | | | SAND (SM) | | |
| | | | | | | | 19.3' | | |
| | | | | | | | SAND (SP) | | |
| 20 | 11 | 24/17 | 20-22 | 3-6<br>7-10 | | | | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/18 | 22-24 | 3-5<br>6-9 | | Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/23 | 24-26 | 5-9<br>10-14 | | Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 25.5 feet to: Yellowish-brown, SILT & CLAY, little Silt, slightly plastic, cohesive, well sorted, moist (CL). | | | |
| 25 | | | | | | | 25.5' | | |
| | | | | | | | CLAY & SILT (CL) | | |
| | | | | | | | 26' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 3 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/24 | 26-28 | 6-8<br>13-13 | | Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 26.3 feet to: Yellowish-brown, SILT & CLAY, little Silt, slightly plastic, cohesive, well sorted, moist (CL). Changing at 27.7 feet to: Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). | SAND (SP)<br>26.3'<br>CLAY & SILT (CL)<br>27.7'<br>SAND (SP) | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/23 | 28-30 | 4-10<br>8-13 | | Yellowish-brown, CLAY & SILT, little Sand, slightly plastic, cohesive, well sorted, moist (CL). Changing at 28.9 feet to: Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 29.1 feet: Yellowish-brown, CLAY & SILT, little Sand, slightly plastic, cohesive, well sorted, moist (CL). Changing at 29.3 feet to: Yellowish-brown, SILT, cohesive, well sorted, moist (ML). Changing at 29.9 feet to: Yellowish-brown, CLAY & SILT, little Sand, slightly plastic, cohesive, well sorted, moist (CL). | 28'<br>CLAY & SILT (CL)<br>28.9'<br>29.1' SAND (SP)<br>29.3' CLAY & SILT (CL)<br>SILT (ML)<br>29.9' | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/22 | 30-32 | 9-12<br>16-15 | | | CLAY & SILT (CL)<br>30.6'<br>SAND (SP) | | |
| 31 | | | | | | | 31'<br>CLAY & SILT (CL) | | |
| 32 | 17 | 24/22 | 32-34 | 4-10<br>8-13 | | Yellowish-brown, CLAY & SILT, little Sand, slightly plastic, cohesive, well sorted, moist (CL). Changing at 30.6 feet to: Light yellowish-brown to pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 31.0 feet to: Yellowish-brown, CLAY & SILT, little Silt, slightly plastic, cohesive, well sorted, moist (CL). | 32.5'<br>SAND (SP) | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/23 | 34-36 | 7-13<br>20-25 | | Yellowish-brown, CLAY & SILT, little Silt, slightly plastic, cohesive, well sorted, moist (CL). Changing at 32.5 feet to: Light gray to light brownish-gray, fine grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 35 | | | | | | Light gray to light brownish-gray, fine grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 36 | 19 | 24/20 | 36-38 | 4-11<br>18-26 | | Light gray to light brownish-gray, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing 37.1 feet to: Light gray, fine to medium SAND, trace Silt, well sorted, moist (SP). | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/23 | 38-40 | 4-7<br>12-15 | | Very pale brown to light yellowish-brown, SILT, little Clay, slightly plastic, coheisve, well sorted, moist (ML). Changingn at 38.2 feet to: Yellowish-brown, CLAY & SILT, plastic, cohesive, moderately well sorted, moist (CL). Changing at 38.4 feet to: Very pale, brown to light yellowish-brown, SILT, little Clay, slightly plastic, cohesive, | 38'<br>38.2' SILT (ML)<br>38.4' CLAY & SILT (CL)<br>38.7' SILT (ML)<br>38.9' CLAY & SILT (CL)<br>SILT (ML)<br>40' | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 4 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/20 | 40-42 | 5-10<br>14-14 | | moderately well sorted, moist (ML). Changing at 38.7 feet to: Yellowish-brown, CLAY & SILT, plastic, cohesive, moderately well sorted, moist (CL). Changing at 38.9 feet to: Very pale brown to light yellowish-brown, SILT, little Clay, slightly plastic, cohesive, well sorted, moist (ML). Light yellowish-brown, CLAY & SILT, slight plastic, cohesive, very well sorted, moist (CL). Changing at 40.2 feet to: Very pale brown to yellowish-brown, SILT, little Clay, slightly plastic, coheisive, well sorted, moist (ML). Changing at 40.5 feet to: Light yellowish-brown, CLAY & SILT, slight plastic, cohesive, very well sorted, moist (CL). Changing at 41.0 feet to: Very pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). | 40.2' CLAY & SILT (CL)<br>40.5' SILT (ML)<br>CLAY & SILT (CL)<br>41' SAND (SP) | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/18 | 42-44 | 5-5<br>11-13 | | | 42.2'<br>42.4' SILT (ML)<br>SAND (SP) | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/20 | 44-46 | 10-10<br>15-22 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 42.2 feet to: Light yellowish-brown, SILT, trace Clay, slightly plastic, cohesive, well sorted, moist (ML).Changing at 42.4 feet to: Very pale, brown, fine grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 45 | | | | | | | 45.3'<br>45.6' CLAY (CL)<br>SAND (SP) | | |
| 46 | 24 | 24/20 | 46-48 | 4-13<br>16-21 | | Very pale, brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 45.3 feet to: Brown to yellowish-brown, CLAY & SILT, plastic, cohesive, very well sorted, moist (CL). Changing at 45.6 feet to: Very pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/17 | 48-50 | 5-12<br>23-28 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Very pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/20 | 50-52 | 4-6<br>15-17 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 51.2 feet to: Yellowish-brown, SILT, trace Clay, cohesive, non to slightly plastic, very well sorted (bedded), moist (ML).Changing at 51.7 feet to: Very pale brown, fine grained SAND, trace Silt, very well sorted, moist, with occasional very thin Silt seams (SP). | | | |
| 51 | | | | | | | 51.2'<br>SILT (ML)<br>51.7'<br>SAND (SP) | | |
| 52 | 27 | 24/16 | 52-54 | 7-12<br>16-21 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist, with occasional very thin Silt seams (SP). | | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 5 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 28 | 24/20 | 54-56 | 5-11<br>17-26 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist, with occasional very thin Silt seams (SP). Changing at 54.2 feet to: Very pale brown, fine grained SAND, little Silt, very well sorted, moist (SP). | 54.2'<br>SAND (SM) | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/23 | 56-58 | 4-9<br>16-20 | | Light yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, moist (SP). Changing at 56.3 feet to: Very pale brown, fine grained SAND, little Silt, very well sorted, moist (SM). | 56'<br>SAND (SP)<br>56.3'<br>SAND (SM) | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24/24 | 58-60 | 9-13<br>18-24 | | Very pale brown, fine grained SAND, little Silt, very well sorted, moist (SM). Changing at 59.0 feet to: Brown, fine grained SAND, some Silt, very well sorted, moist to wet (SM). | | | |
| 59 | | | | | | | | | |
| 60 | 31 | 24/22 | 60-62 | 11-13<br>22-28 | | Brown, fine grained SAND, little Silt, non plastic, moderately cohesive, very well sorted, moist (SP). | | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/22 | 62-64 | 6-6<br>11-14 | | Brown, fine grained SAND, little Silt, non plastic, moderately cohesive, very well sorted, moist (SM). Changing at 62.7 feet to: Brown, fine to medium grained SAND, trace Silt, grading fine with depth, well sorted, damp (SP). Changing at 63.0 feet to: Brown, fine grained SAND, trace Silt, very well sorted, damp (SP). | 62.7'<br>63'<br>SAND (SP)<br>SAND (SM) | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/20 | 64-66 | 11-3<br>6-11 | | Brown, fine to medium grained SAND, trace Silt, grading fine with depth, well sorted, damp (SP). Changing at 65.0 feet to: Brown, fine grained SAND, some Silt, very well sorted, damp (SM). Changing at 65.1 feet to: Brown, fine to medium grained SAND, trace Silt, grading fine with depth, well sorted, wet (SP). Changing at 65.6 feet to: Brown, CLAY & SILT, plastic, cohesive, well sorted, moist (CL). | 64'<br>SAND (SP)<br>65'<br>65.1'<br>SAND (SM)<br>SAND (SP)<br>65.6'<br>CLAY & SILT (CL) | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/24 | 66-68 | 5-11<br>12-14 | | Brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). Changing at 67.0 feet to: Yellowish-brown, fine to medium grained SAND, little Silt, very well sorted wet (SP). | 66'<br>SAND (SP)<br>67'<br>SAND (SM) | | |
| 67 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 6 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 35 | 24/13 | 68-70 | 2-4<br>7-13 | | Yellowish-brown, fine to medium grained SAND, little Silt, very well sorted wet (SP). | SAND (SM) | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/18 | 70-72 | 2-6<br>12-16 | | Yellowish-brown, fine to medium grained SAND, little Silt, very well sorted wet (SP). | | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/23 | 72-74 | 3-3<br>5-9 | | Brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). Changing at 73.1 feet to: Brown, CLAY & SILT, slightly plastic, moderately cohesive, well sorted, moist to wet (CL). | 72'<br>SAND (SP)<br>73.1'<br>CLAY & SILT (CL) | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/20 | 74-76 | 2-1<br>2-2 | | Brown, CLAY & SILT, slightly plastic, moderately cohesive, well sorted, moist to wet (CL). | | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/19 | 76-78 | 2-5<br>8-11 | | Brown, CLAY & SILT, slightly plastic, moderately cohesive, well sorted, moist to wet (CL). | | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/23 | 78-80 | 2-4<br>5-10 | | Brown, CLAY & SILT, slightly plastic, moderately cohesive, well sorted, moist to wet (CL). Changing at 79.3 feet to: Yellowish-brown, CLAY & SILT, plastic, cohesive, well sorted, moist (CL). Changing at 79.4 feet to: Yellowish-brown, medium to coarse grained SAND, trace Silt, moderately well sorted, wet (SW). | 79.4'<br>SAND (SW)<br>80' | | |
| 79 | | | | | | | | | |
| 80 | 41 | 24/22 | 80-82 | 2-4<br>6-7 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | SAND (SP)<br>82' | | |
| 81 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 7 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 42 | 24/24 | 82-84 | 2-5<br>11-12 | | Yellowish-brown, medium to coarse grained SAND, trace Silt, well sorted, wet (SW). Changing at 82.4 feet to: Yellowish-brown, medium to coarse grained SAND, trace Silt, poorly sorted, wet (SW). Changing at 83.2 feet to: Yellowish-brown to gray, GRAVEL, some coarse grained Sand, trace Silt, poorly sorted, wet (GW). Changing at 83.4 feet to: Yellowish-brown, CLAY & SILT, plastic, coheisve, well sorted, moist (CL). Changing at 83.5 feet to: Yellowish-brown to gray, GRAVEL, some coarse grained Sand, trace Silt, poorly sorted, wet (GW). Changing at 83.7 feet to: Yellowish-brown, fine to medium SAND, trace Silt, trace Gravel, well sorted, wet (SP). | SAND (SW)<br>82.4'<br>SAND (SW)<br>83.4'<br>83.5'<br>CLAY & SILT (CL)<br>83.7'<br>GRAVEL (GW)<br>SAND (SP)<br>84.7'<br>GRAVEL (GW)<br>85.2'<br>SAND (SP) | | Grout |
| 83 | | | | | | | | | |
| 84 | 43 | 24/23 | 84-86 | 3-6<br>11-14 | | | | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/24 | 86-88 | 3-4<br>9-15 | | Yellowish-brown, fine to medium SAND, trace Silt, trace Gravel, well sorted, wet (SP). Changing at 84.7 feet to: Yellowish-brown to gray, GRAVEL, some coarse to medium grained Sand, trace Silt, poorly sorted, wet (GW). Changing at 85.2 feet to: Yellowish-brown, fine grained SAND, trace Silt, very well sorted, wet (SP). | | | |
| 87 | | | | | | | 87.2'<br>SAND (SW) | | |
| 88 | 45 | 24/16 | 88-90 | 3-5<br>8-12 | | Yellowish-brown, fine grained SAND, trace Silt, very well sorted, wet (SP). Changing at 87.2 feet to: Yellowish-brown, coarse grained SAND, some Gravel, trace Silt, very well sorted, wet (SW). | | | |
| 89 | | | | | | Yellowish-brown, medium to coarse grained SAND, some Gravel, trace Silt, poorly sorted wet (SW). | | | |
| 90 | 46 | 24/22 | 90-92 | 3-4<br>7-11 | | Yellowish-brown, fine to medium SAND, trace Silt, moderately sorted, wet (SP). Changing at 91.6 feet to: Dark grayish-brown, CLAY & SILT, plastic, cohesive, well sorted, moist (CL). Changing at 91.7 feet to: Yellowish-brown, medium to coarse grained SAND, trace Silt, trace Gravel, grading finer with depth, well sorted, wet (SW). | 90'<br>SAND (SP)<br>91.6'<br>91.7'<br>CLAY & SILT (CL)<br>SAND (SW) | | |
| 91 | | | | | | | | | |
| 92 | 47 | 24/1 | 92-94 | 5-7<br>12-13 | | Yellowish-brown, medium to coarse grained SAND, trace Silt, trace Gravel, grading finer with depth, well sorted, wet (SW). | | 1 | |
| 93 | | | | | | | | | |
| 94 | 48 | 24/4 | 94-96 | 5-7<br>9-10 | | Yellowish-brown, medium to coarse grained SAND, trace Silt, trace Gravel, grading finer with depth, well sorted, wet (SW). | | | |
| 95 | | | | | | | | | |

**REMARKS**

1. Groundwater was encountered at approximately 91.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 8 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 49 | 24/8 | 96-98 | 2-3<br>6-12 | | Yellowish-brown, medium to coarse grained SAND, trace Silt, trace Gravel, grading finer with depth, well sorted, wet (SW). | SAND (SW) | | |
| 97 | | | | | | | | | |
| 98 | 50 | 24/11 | 98-100 | 2-3<br>10-12 | | Yellowish-brown, medium to coarse grained SAND, trace Silt, trace Gravel, grading finer with depth, well sorted, wet (SW). | | | |
| 99 | | | | | | | | | |
| 100 | 51 | 24/23 | 100-102 | 3-4<br>9-13 | | Yellowish-brown, medium to coarse grained SAND, trace Silt, trace Gravel, grading finer with depth, well sorted, wet (SW). Changing at 101.8 feet to: Dark yellowish-brown to yellowish-brown, CLAY & SILT, moderately plastic, cohesive, well sorted, moist (CL). | | | |
| 101 | | | | | | | 101.8' | | |
| 102 | 52 | 24/11 | 102-104 | 1-1<br>3-9 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | 102 CLAY & SILT (CL)<br>SAND (SP) | | |
| 103 | | | | | | | | | |
| 104 | 53 | 24/11 | 104-106 | 4-4<br>15-26 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 105 | | | | | | | | | |
| 106 | 54 | 24/11 | 106-108 | 1-5<br>15-30 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24/10 | 108-110 | 4-9<br>25-32 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 109 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 9 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 56 | 24/10 | 110-112 | 4-9<br>20-31 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | SAND (SP) | | |
| 111 | | | | | | | | | |
| 112 | 57 | 24/8 | 112-114 | 2-5<br>14-27 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 113 | | | | | | | | | |
| 114 | 58 | 24/11 | 114-116 | 2-4<br>10-28 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 115 | | | | | | | | | |
| 116 | 59 | 24/14 | 116-118 | 4-10<br>25-40 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 117 | | | | | | | | | |
| 118 | 60 | 24/10 | 118-120 | 3-7<br>21-25 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 119 | | | | | | | | | |
| 120 | 61 | 24/16 | 120-122 | 4-7<br>14-31 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 121 | | | | | | | | | |
| 122 | 62 | 24/14 | 122-124 | 3-6<br>22-32 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 123 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 10 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 24/19 | 124-126 | 5-13<br>29-45 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | SAND (SP) | | |
| 125 | | | | | | | | | |
| 126 | 64 | 24/1 | 126-128 | 1-5<br>18-34 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 127 | | | | | | | | | |
| 128 | 65 | 24/24 | 128-130 | 6-18<br>34-48 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 129 | | | | | | | | | |
| 130 | 66 | 24/23 | 130-132 | 5-10<br>28-46 | | Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). Changing at 131.5 feet to: Yellowish-brown, medium to coarse grained SAND, trace Silt, moderately sorted, wet (SW). Changing at 131.7 feet to: Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 131 | | | | | | | | | |
| 132 | 67 | 24/23 | 132-134 | 5-15<br>30-45 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 133 | | | | | | | | | |
| 134 | 68 | 24/24 | 134-136 | 3-5<br>21-31 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 135 | | | | | | | | | |
| 136 | 69 | 24/11 | 136-138 | 6-16<br>29-43 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 137 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 11 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 70 | 24/6 | 138-140 | 2-3<br>13-33 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | SAND (SP) | | |
| 139 | | | | | | | | | |
| 140 | 71 | 24/11 | 140-142 | 2-4<br>9-27 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 141 | | | | | | | | | |
| 142 | 72 | 24/14 | 142-144 | 3-10<br>25-42 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 143 | | | | | | | | | |
| 144 | 73 | 24/20 | 144-146 | 9-25-50/5" | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 145 | | | | | | | | | |
| 146 | 74 | 24/18 | 146-148 | 6-27<br>52-53 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 147 | | | | | | | | | |
| 148 | 75 | 24/12 | 148-150 | 9-34<br>48-50/3" | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 149 | | | | | | | | | |
| 150 | 76 | 24/0 | 150-152 | 6-11<br>26-29 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 151 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 12 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 77 | 24/24 | 152-154 | 2-8<br>26-31 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | SAND (SP) | | |
| 153 | | | | | | | | | |
| 154 | 78 | 24/20 | 154-156 | 5-12<br>28-43 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 155 | | | | | | | | | |
| 156 | 79 | 24/1 | 156-158 | 3-6<br>18-21 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 157 | | | | | | | | | |
| 158 | 80 | 24/24 | 158-160 | 7-8<br>19-25 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 159 | | | | | | | | | |
| 160 | 81 | 24/7 | 160-162 | 3-10<br>21-29 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 161 | | | | | | | | | |
| 162 | 82 | 24/0 | 162-164 | 4-11<br>25-32 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 163 | | | | | | | | | |
| 164 | 83 | 24/6 | 164-166 | 1-14<br>34-45 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | | |
| 165 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

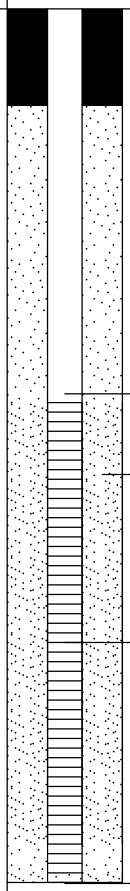
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-1/MW-1D
**Page:** 13 **of** 13
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 84 | 24/24 | 166-168 | 9-29<br>51-50/3" | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | SAND (SP) | |
| 167 | | | | | | | | |
| 168 | 85 | 24/13 | 168-170 | 3-6<br>18-34 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | |
| 169 | | | | | | | | |
| 170 | 86 | 24/1 | 170-172 | 5-6<br>19-44 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | | |
| 171 | | | | | | | | |
| 172 | 87 | 24/16 | 172-174 | 2-4<br>7-14 | | Yellowish-brown, fine to medium grained SAND, little Silt, trace Gravel, well sorted, wet (SP). | 172'<br>SAND (SM) | |
| 173 | | | | | | | | |
| 174 | 88 | 24/24 | 174-176 | 8-13<br>21-23 | | Yellowish-brown, fine to medium grained SAND, little Silt, very well sorted, wet (SP). Changing at 174.7 feet to: Yellowish-brown, SILT, trace Clay, non plastic, cohesive, very well sorted (bedded), moist (ML). Changing at 175.5 feet to: Yellowish-brown, SILT, trace Clay, moderately plastic, cohesive, very well sorted (bedded), wet (ML). | 174.7'<br>SILT (ML) | |
| 175 | | | | | | | | |
| 176 | | | | | | Bottom of Borehole at 176.0 Feet | 176' | 2 |
| 177 | | | | | | | | |
| 178 | | | | | | | | |
| 179 | | | | | | | | |

**Equipment Installed**




**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from 170.1 to 174.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-1/MW-1D

BORING_WELL 6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** MW-1S
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-5-17 / 9-5-17
**Boring Location:**
**GS Elev.:** 788.70' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

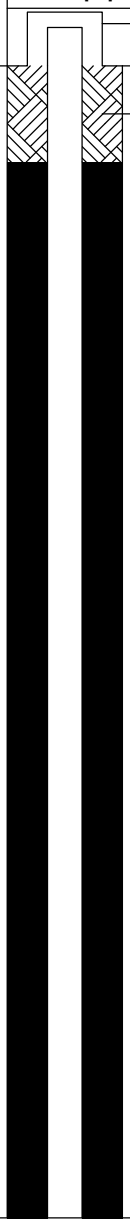
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | See SB-1/MW-1D boring log for detailed soil descriptions. | | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-1S

GZA
GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** MW-1S
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information | | | | | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-1S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** MW-1S
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | Bentonite/Grout |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-1S

GZA
GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** MW-1S
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information | | | | | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-1S

GZA
GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** MW-1S
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | Bentonite Seal |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

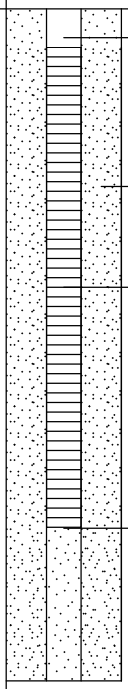
**Boring No.:** MW-1S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** MW-1S
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 69 | | | | | | | | | Top of Well Screen |
| 70 | | | | | | | | | Silica Sand Filter Pack |
| 71 | | | | | | | | | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | Bottom of Well Screen |
| 74 | | | | | | | | | |
| 75 | | | | | | Bottom of Borehole at 75.0 Feet | | 1 | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |



**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 68.4 to 73.1 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-1S

BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-2/MW-2S
**Page:** 1 **of** 7
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-11-17 / 9-11-17
**Boring Location:**
**GS Elev.:** 797.60' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

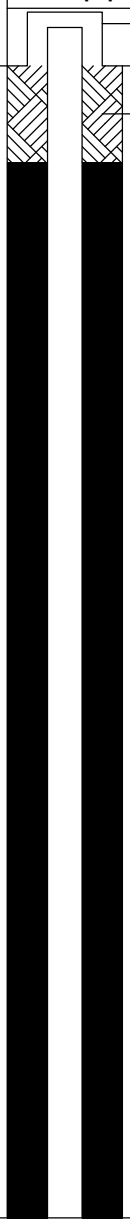
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/18 | 0-2 | 7-8 8-10 | | Dark brown to yellowish-brown, SILT & CLAY, some Sand, plastic, cohesive, poorly sorted, moist (CL). | CLAY & SILT (CL) | |
| 2 | 2 | 24/23 | 2-4 | 8-8 9-9 | | Dark brown to yellowish-brown, SILT & CLAY, some Sand, plastic, cohesive, poorly sorted, moist (CL). | | |
| 4 | 3 | 24/22 | 4-6 | 5-6 7-7 | | Dark brown to yellowish-brown, CLAY & SILT, some Sand, plastic, cohesive, poorly sorted, moist (CL). Changing at 4.6 feet to: Brown to grayish-brown, SILT, some fine grained Sand, trace Clay, non to slightly plastic, slightly cohesive, moderately sorted moist (ML). Changing at 5.1 feet to: Yellowish-brown to brown, CLAY & SILT, some Sand, moderately plstic, cohesive, moderately sorted, moist (CL). | 4.6' SILT (ML) 5.1' CLAY & SILT (CL) | |
| 6 | 4 | 24/22 | 6-8 | 4-5 5-6 | | Yellowish-brown to brown, CLAY & SILT, some Sand, moderately plstic, cohesive, moderately sorted, moist (CL). | | |
| 8 | 5 | 24/17 | 8-10 | 2-4 6-6 | | Yellowish-brown to brown, CLAY & SILT, some Sand, moderately plastic, cohesive, moderately sorted, moist (CL). Changing at 9.0 feet to: Dark yellowish-brown, fine to medium SAND, trace Silt, moderately sorted moist (SP). | 9' SAND (SP) | |
| 10 | 6 | 24/17 | 10-12 | 3-4 4-4 | | Mottled dark yellowish-red to dark reddish-brown to dark brown to dark grayish-brown, SILT, some fine grained SAND, moderately sorted, moist (ML). Changing at 10.5 feet to: Yellowish-brown to pale brown, fine to medium SAND, trace Silt, well sorted, moist (SP). | 10' SILT (ML) 10.5' SAND (SP) | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-2/MW-2S

BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-2/MW-2S
**Page:** 2 **of** 7
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24/17 | 12-14 | 2-2<br>3-4 | | Yellowish-brown to pale brown, fine to medium SAND, trace Silt, well sorted, moist (SP). | SAND (SP) | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/22 | 14-16 | 2-2<br>3-5 | | Yellowish-brown to pale brown, fine to medium SAND, trace Silt, well sorted, moist (SP). Changing at 15.2 feet to: Soft, Dark brown, CLAY & SILT, plastic, cohesive, moderately sorted, moist (CL). Changing at 15.3 feet to: Yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, well sorted, moist (SP). | 15.2'<br>15.3' CLAY & SILT (CL)<br>SAND (SP) | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/24 | 16-18 | 4-5<br>6-6 | | Yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, well sorted, moist (SP). Changing at 16.6 feet to: Yellowish-brown, CLAY & SILT, plastic, cohesive, moderately sorted, moist (CL). | 16.6'<br>CLAY & SILT (CL) | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/14 | 18-20 | 4-5<br>8-10 | | Yellowish-brown, CLAY & SILT, plastic, cohesive, moderately sorted, moist (CL). Changing at 18.6 feet to: Yellowish-brown, fie to coarse grained SAND, some Gravel, trace Silt, poorly sorted, moist SW). Changing at 19.0 feet to: Yellowish-brown, CLAY & SILT, plastic, cohesive, moderately sorted, moist (CL). Changing at 19.3 feet to: Yellowish-brown, fine grained SAND, some Silt, non plastic, moderately cohesive, well sorted, moist (SM). | 18.6'<br>SAND (SW)<br>19'<br>19.3' CLAY & SILT (CL)<br>SAND (SM)<br>20'<br>CLAY & SILT (CL) | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/24 | 20-22 | 4-5<br>8-10 | | | | | |
| 21 | | | | | | Dark yellowish-brown to yellowish-brown, SILT & CLAY, moderately plastic, cohesive, well sorted, moist (CL). Changing at 21.7 feet to: Light gray to light brownish-gray, fine grained SAND, trace Silt, very well sorted, moist (SP). | 21.7'<br>22' SAND (SP) | | |
| 22 | 12 | 24/16 | 22-24 | 2-3<br>5-6 | | Dark yellowish-brown to yellowish-brown, SILT & CLAY, moderately plastic, cohesive, well sorted, moist (CL). Changing at 22.4 feet to: Light yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | CLAY & SILT (CL)<br>22.4'<br>SAND (SP) | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/16 | 24-26 | 4-6<br>6-6 | | Light yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 25 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-2/MW-2S
**Page:** 3 **of** 7
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/20 | 26-28 | 4-5<br>6-6 | | Light yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/18 | 28-30 | 6-7<br>12-12 | | Light yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/22 | 30-32 | 7-9<br>11-13 | | Light yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). Changing at 31.7 feet to: Light yellowish-brown, fine to medium grained SAND, trace Gravel, trace Silt, moderately well sorted, moist (SP). | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/18 | 32-34 | 7-7<br>7-8 | | Light yellowish-brown to yellowish-brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 32.2 feet to: Pale brown to very pale brown, fine to coarse grained SAND, some Gravel, trace Silt, poorly sorted, moist (SW). | 32.2'<br>SAND (SW) | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/20 | 34-36 | 13-38<br>31-18 | | Pale brown, fine to coarse grained SAND, some Gravel, trace Silt, poorly sorted, moist (SW). | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/20 | 36-38 | 2-4<br>7-8 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | 36'<br>SAND (SP) | | |
| 37 | | | | | | | | | Grout |
| 38 | 20 | 24/19 | 38-40 | 2-3<br>6-7 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-2/MW-2S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-2/MW-2S
**Page:** 4 **of** 7
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/20 | 40-42 | 5-7<br>9-13 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | SAND (SP) | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/19 | 42-44 | 4-6<br>9-11 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/22 | 44-46 | 5-8<br>10-13 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/22 | 46-48 | 3-5<br>8-13 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/23 | 48-50 | 5-7<br>9-10 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/22 | 50-52 | 6-7<br>12-13 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/20 | 52-54 | 5-9<br>11-13 | | Very pale brown, fine grained SAND, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). Changing at 52.8 feet to: Yellowish-brown, CLAY & SILT, well sorted, moist (CL). Changing at 52.9 feet to: Very pale brown, fine grained SAND, trace Silt, very well sorted, moist (SP). | 52.8'<br>52.9' CLAY & SILT (CL)<br>SAND (SP)<br>54' | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-2/MW-2S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-2/MW-2S
**Page:** 5 **of** 7
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 28 | 24/22 | 54-56 | 5-9<br>13-13 | | Yellowish-brown, fine to coarse grained SAND, trace Gravel, trace Silt, poorly sorted, moist (SW). Changing at 55.0 feet to: Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, grading to fine to medium grained Sand, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | SAND (SW)<br>55'<br>SAND (SM) | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/22 | 56-58 | 3-5<br>11-14 | | Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24/20 | 58-60 | 8-12<br>15-20 | | Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 59 | | | | | | | | | |
| 60 | 31 | 24/20 | 60-62 | 5-9<br>10-11 | | Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/22 | 62-64 | 8-11<br>14-15 | | Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/18 | 64-66 | 2-4<br>8-14 | | Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/18 | 66-68 | 6-14<br>17-18 | | Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 67 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-2/MW-2S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-2/MW-2S
**Page:** 6 **of** 7
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 35 | 24/18 | 68-70 | 5-14<br>19-24 | | Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). Changing at 69.3 feet to: Light yellowish-brown, fine to coarse grained SAND, trace Silt, moderately sorted, moist (SW). Changing at 69.4 feet to: Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, grading to fine to medium grained Sand, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | SAND (SM)<br>69.3'<br>69.4 SAND (SW)<br>SAND (SP) | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/16 | 70-72 | 4-10<br>17-19 | | | | | |
| 71 | | | | | | Very pale brown grading to yellowish-brown, fine grained SAND, little Silt, grading to fine to medium grained Sand, trace Silt, very well sorted, moist with occasional trace Gravel, moist (SP). | | | |
| 72 | 37 | 24/18 | 72-74 | 6-14<br>24-23 | | Brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/23 | 74-76 | 2-3<br>5-10 | | Brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). Changing at 75.5 feet to: Brown, fine to coarse grained SAND, trace Silt, trace Gravel, poorly sorted, wet (SW). | | | |
| 75 | | | | | | | 75.5'<br>SAND (SW) | | |
| 76 | 39 | 24/18 | 76-78 | 2-8<br>14-20 | | Brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/18 | 78-80 | 3-7<br>10-18 | | Brown, fine to coarse grained SAND, trace Silt, trace Gravel, poorly sorted, wet (SW). | | | Top of Well Screen<br>Silica Sand Filter Pack |
| 79 | | | | | | | | | |
| 80 | 41 | 24/18 | 80-82 | 3-9<br>9-19 | | Brown, fine to coarse grained SAND, trace Silt, trace Gravel, poorly sorted, wet (SW). Changing at 80.7 feet to: Brown, fine to medium SAND, trace Silt, trace Gravel, moderately well sorted, wet (SW). | 80.7'<br>SAND (SP) | | |
| 81 | | | | | | | 82' | | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |

**REMARKS**

1. Groundwater was not encountered during drilling or upon completion.
2. Monitoring well was installed in borehole upon completion. Well screen set from 78.5 to 83.1 feet below ground surface.

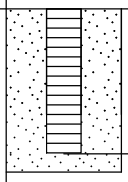
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-2/MW-2S

GZA
GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-2/MW-2S
**Page:** 7 **of** 7
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bottom of Borehole at 82.0 Feet | | 1<br>2 |  Bottom of Well Screen |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-2/MW-2S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-3P/MW-3P
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-12-17 / 9-12-17
**Boring Location:**
**GS Elev.:** 787.50' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

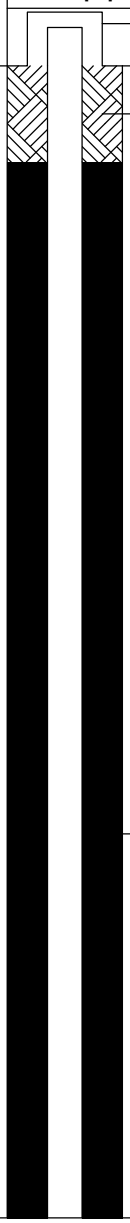
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | See SB-3/MW-3S boring log for detailed soil descriptions. | | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-3P/MW-3P

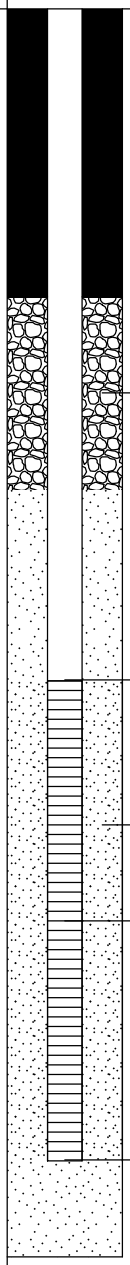
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-3P/MW-3P
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | 1 | 24/24 | 23-25 | 3-4<br>7-9 | | Medium dense, brown, well sorted, fine SAND, trace Silt, wet (SP). Changing at 24.3 feet to: Hard, gray and brown mottled, CLAY, trace Silt, damp (CL). | SAND (SP) | |
| 24 | | | | | >4.0 tsf | | 24.3'<br>CLAY (CL) | 1 |
| 25 | | | | | | Bottom of Borehole at 25.0 Feet | 25' | 2 |

**Equipment Installed**




**REMARKS**

1. Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate consistency of cohesive soil.
2. Monitoring well was installed in borehole upon completion. Well screen set from 19.0 to 24.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-3P/MW-3P

BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-3/MW-3S
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-12-17 / 9-12-17
**Boring Location:**
**GS Elev.:** 788.10' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

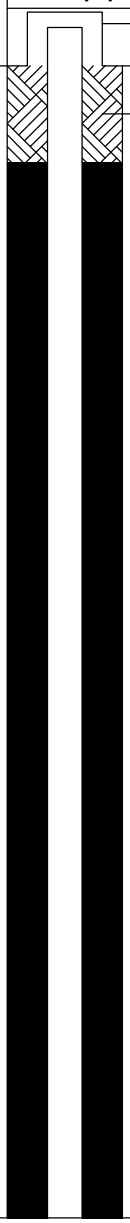
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/21 | 0-2 | 5-6<br>6-7 | 0.0 ppm<br>>4.0 tsf | Hard, brown, CLAY, trace Silt, trace fine Sand, dry (CL). | CLAY (CL) | 1<br>2 |
| 1 | | | | | | | | |
| 2 | 2 | 24/21 | 2-4 | 7-5<br>5-4 | 0.0 ppm | Loose, dark brown, yellowish brown, fine SAND, trace Silt, damp (SP). | 2'<br>SAND (SP) | |
| 3 | | | | | | | | |
| 4 | 3 | 24/14 | 4-6 | 3-2<br>2-3 | 0.0 ppm | Loose, dark yellowish brown, fine SAND, trace Silt, damp (SP) Changing at 5.2 feet to: Loose, dark yellowish-brown, fine SAND, little Gravel, trace Silt, damp (SP). | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/21 | 6-8 | 2-5<br>5-5 | | Loose, yellowish-brown, well sorted, fine SAND, damp (SP). Changing at 7.8 feet to: Loose, pale brown, fine SAND, damp (SP). | | |
| 7 | | | | | | | | |
| 8 | 5 | 24/21 | 8-10 | 1-4<br>5-7 | | Loose, pale brown, well sorted, fine SAND, trace Silt, damp (SP). | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/20 | 10-12 | 4-5<br>6-7 | | Loose, pale brown, well sorted, fine SAND, trace Silt, damp (SP). | | |
| 11 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.
2. Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate consistency of cohesive soil.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-3/MW-3S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-3/MW-3S
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24/20 | 12-14 | 3-5<br>5-5 | | Loose, pale brown, well sorted, fine SAND, trace Silt, damp (SP). | SAND (SP) | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/20 | 14-16 | 4-5<br>5-5 | | Loose, pale brown, well sorted, fine SAND, trace Silt, damp (SP). | | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/24 | 16-18 | 2-5<br>9-10 | >4.0 tsf | Loose, pale brown, well sorted, fine SAND, trace Silt, damp (SP). Changing at 16.2 feet to: Hard, brown, CLAY, trace Silt, damp (CL). Changing at 17.8 feet to: Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | 16.2'<br>CLAY (CL) | | |
| 17 | | | | | | | 17.8'<br>SAND (SP) | | |
| 18 | 10 | 24/24 | 18-20 | 2-6<br>7-9 | | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). Changing at 18.2 feet to: Brown, CLAY, trace Silt, damp (CL). Changing at 19.0 feet to: Medium dense, brown, well sorted, fine to medium SAND, trace Silt, moist (SP). | 18.2'<br>CLAY (CL) | | |
| 19 | | | | | | | 19'<br>SAND (SP) | | |
| 20 | 11 | 24/24 | 20-22 | 5-6<br>7-10 | >4.0 tsf | Hard, brown, CLAY, trace Silt, damp (CL). Changing at 20.5 feet to: Medium dense, brown, well sorted, fine to medium SAND, trace Silt, moist (SP). Changing at 21.5 feet to: Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | 20'<br>CLAY (CL)<br>20.5'<br>SAND (SP) | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/22 | 22-24 | 4-4<br>5-6 | | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). Changing at 23.5 feet to: Medium dense, pale brown, well sorted, fine SAND, some Silt, wet (SM). | | | |
| 23 | | | | | | | 23.5'<br>SAND (SM) | | |
| 24 | 13 | 24/22 | 24-26 | 4-4<br>5-6 | | Medium dense, pale brown, well sorted, fine SAND, some Silt, wet (SM). Changing at 25.3 feet to: Hard, light gray and brown mottled, CLAY, trace Silt, moist (CL). Changing at 25.9 feet to: Loose, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 25 | | | | | | | 25.3'<br>CLAY (CL)<br>25.9' | | |

**REMARKS**

3. Double cased from 0.0 to 25.0 feet during drilling.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-3/MW-3S
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/20 | 26-28 | 2-2<br>6-8 | >4.0 tsf | Loose, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | SAND (SP) | 3 | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/20 | 28-30 | 6-10<br>10-11 | | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/20 | 30-32 | 2-4<br>9-10 | | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/21 | 32-34 | 5-12<br>13-20 | | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/19 | 34-36 | 8-16<br>28-40 | | Dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | Grout |
| 35 | | | | | | | | | |
| 36 | 19 | 24/21 | 36-38 | 18-18<br>19-31 | | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24 | 38-40 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-3/MW-3S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-3/MW-3S
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24 | 40-42 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24 | 42-44 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 43 | | | | | | | | | |
| 44 | 24 | 24 | 44-46 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 45 | | | | | | | | | |
| 46 | 26 | 24 | 46-48 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 47 | | | | | | | | | |
| 48 | 27 | 24 | 48-50 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 49 | | | | | | | | | |
| 50 | 28 | 24 | 50-52 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 51 | | | | | | | | | |
| 52 | 30 | 24 | 52-54 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-3/MW-3S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-3/MW-3S
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 31 | 24 | 54-56 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 55 | | | | | | | | | |
| 56 | 32 | 24 | 56-58 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 57 | | | | | | | | | |
| 58 | 33 | 24 | 58-60 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 59 | | | | | | | | | |
| 60 | 34 | 24 | 60-62 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 61 | | | | | | | | | |
| 62 | 35 | 24 | 62-64 | | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). Changing at 63.0 feet to: Light yellowish-brown to yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 63 | | | | | | | | | |
| 64 | 36 | 24 | 64-66 | | | Yellowish-brown, fine to medium SAND, trace Silt, very well sorted, wet (SP). | | 4 | |
| 65 | | | | | | | | | |
| 66 | 37 | 24 | 66-68 | | | Yellowish-brown, fine to medium SAND, trace Silt, very well sorted, wet (SP). Changing at 67.0 feet to: Yellowish-brown, fine to medium SAND, some Silt, very well sorted, wet (SM). Changing at 67.2 feet to: Yellowish-brown, fine to medium SAND, trace Silt, very well sorted, wet (SP). | 67' 67.2'SAND (SM) SAND (SP) | | |
| 67 | | | | | | | | | |

**REMARKS**

4. Groundwater was encountered at approximately 64.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-3/MW-3S

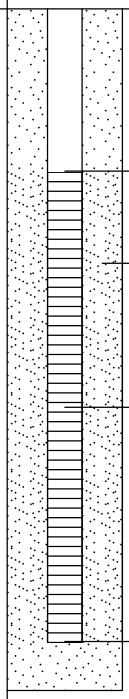
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-3/MW-3S
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 38 | 24 | 68-70 | | | Yellowish-brown, fine to medium SAND, trace Silt, very well sorted, wet (SP). | SAND (SP) | |
| 69 | | | | | | | | |
| 70 | 39 | 24 | 70-72 | | | Yellowish-brown, fine to medium SAND, trace Silt, very well sorted, wet (SP). | | |
| 71 | | | | | | | | |
| 72 | 40 | 24 | 72-74 | | | Yellowish-brown, fine to medium SAND, trace Silt, very well sorted, wet (SP). Changing at 73.8 feet to: Yellowish-brown, fine to medium SAND, some Silt, well sorted, wet (SM). | | |
| 73 | | | | | | | | |
| | | | | | | | 73.8' SAND (SM) | |
| 74 | 41 | 24 | 74-76 | | | Yellowish-brown, fine to medium SAND, some Silt, well sorted, wet (SM). | | |
| 75 | | | | | | | | |
| 76 | | | | | | | 76' | |
| | | | | | | Bottom of Borehole at 76.0 Feet | | 5 |
| 77 | | | | | | | | |
| 78 | | | | | | | | |
| 79 | | | | | | | | |
| 80 | | | | | | | | |
| 81 | | | | | | | | |

**Equipment Installed**




**REMARKS**

5. Monitoring well was installed in borehole upon completion. Well screen set from 69.7 to 74.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-3/MW-3S

BORING_WELL 6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-4/MW-4S
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-12-17 / 9-12-17
**Boring Location:**
**GS Elev.:** 782.30' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

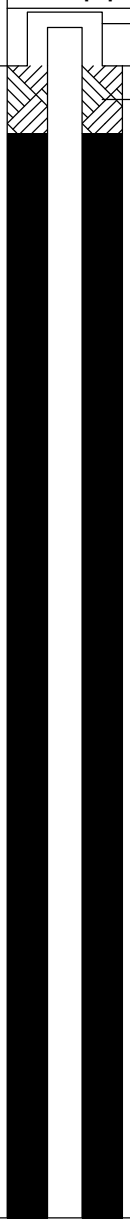
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/14 | 0-2 | 1-1 1-1 | 0.0 ppm | Very loose, yellowish- brown, well sorted, fine SAND, some Organic Matter (roots), trace Silt, dry (SP). | SAND | 1 |
| 1 | | | | | | | | |
| 2 | 2 | 24/14 | 2-4 | 1-2 2-2 | 0.0 ppm | Loose, pale brown, well sorted, fine SAND, damp (SP). | | |
| 3 | | | | | | | | |
| 4 | 3 | 24/13 | 4-6 | 2-2 4-5 | 0.1 ppm | Loose, pale brown, well sorted, fine SAND, damp (SP). | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/14 | 6-8 | 2-3 5-7 | 0.0 ppm | Loose, pale brown, well sorted, fine SAND, damp (SP). | | |
| 7 | | | | | | | | |
| 8 | 5 | 24/14 | 8-10 | 3-3 5-7 | 0.0 ppm | Loose, pale brown, well sorted, fine SAND, damp (SP). | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/21 | 10-12 | 5-5 7-8 | 0.0 ppm | Loose, pale brown, well sorted, fine SAND, damp (SP). Changing at 11.0 feet to: Hard, gray and brown mottled, CLAY, trace Silt, damp (CL). | | |
| 11 | | | | | >4.0 tsf | | 11' CLAY (CL) | 2 |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.
2. Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate consistency of cohesive soil.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-4/MW-4S
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24 | 12-14 | 5-6<br>7-7 | 0.0 ppm<br>>4.0 tsf | Hard, gray and brown mottled, CLAY, trace Silt, damp (CL). Changing at 13.0 feet to: Medium dense, pale brown and brown mottled, well sorted, fine SAND, trace Silt, damp (SP). | CLAY (CL)<br>13'<br>SAND (SP) | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/24 | 14-16 | 2-2<br>3-2 | 0.0 ppm | Loose, yellowish-brown, well sorted, fine SAND, trace Silt, damp (SP). | | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/18 | 16-18 | 1-1<br>1-3 | 0.0 ppm | Loose, yellowish-brown, well sorted, fine SAND, trace Silt, damp (SP). Changing at 17.8 feet to: Loose, yellowish-brown, well sorted, fine GRAVEL, trace Silt, damp (GW). | | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/16 | 18-20 | 2-3<br>6-7 | 0.0 ppm | Loose, yellowish-brown, well sorted, fine GRAVEL, trace Silt, damp (GW). Changing at 19.0 feet to: Medium dense, yellowish-brown, well sorted, fine SAND, trace Silt, damp (SP). | 18'<br>GRAVEL (GW)<br>19'<br>SAND (SP) | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/15 | 20-22 | 6-7<br>9-9 | 0.0 ppm | Medium dense, yellowish-brown, well sorted, fine SAND, trace Silt, damp (SP). | | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/24 | 22-24 | 4-8<br>8-10 | 0.0 ppm | Medium dense, yellowish-brown, well sorted, fine SAND, trace Silt, moist (SP). Changing at 23.9 feet to: Hard, brown, CLAY, damp (CL). | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/24 | 24-26 | 6-7<br>9-10 | 0.0 ppm<br>>4.0 tsf | Hard, brown, CLAY, damp (CL). | 23.9'<br>CLAY (CL)<br>26' | | |
| 25 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-4/MW-4S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-4/MW-4S
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/0 | 26-28 | | | NO RECOVERY. | NO RECOVERY | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/16 | 28-30 | 5-9 11-15 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, damp (SP). | 28' SAND (SP) | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/15 | 30-32 | 6-12 13-21 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, damp (SP). | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/17 | 32-34 | 4-18 31-39 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, trace Silt, damp (SP). | | | |
| 33 | | | | | | | | | Bentonite/Grout |
| 34 | 18 | 24/17 | 34-36 | 7-10 15-19 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, damp (SP). | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/17 | 36-38 | 4-10 15-22 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, damp (SP). | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/20 | 38-40 | 10-12 21-24 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-4/MW-4S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-4/MW-4S
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/17 | 40-42 | 10-11 16-19 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). Encountered Rock at 40.2 feet. | SAND (SP) | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/19 | 42-44 | 7-11 17-25 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/19 | 44-46 | 7-12 23-26 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/19 | 46-48 | 10-14 15-15 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/20 | 48-50 | 8-14 36-49 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/24 | 50-52 | 18-37 47-47 | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/21 | 52-54 | 33-29 52-50/3" | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-4/MW-4S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-4/MW-4S
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 28 | 24/16 | 54-56 | 19-58-50/4" | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | SAND (SP) | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24 | 56-58 | | | Light yellowish-brown to pale brown, very well sorted, fine to medium SAND, trace Silt, moist (SP). | | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24 | 58-60 | | | Light yellowish-brown to pale brown, very well sorted, fine to medium SAND, trace Silt, moist (SP). Changing at 59.6 feet to: Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | | | |
| 59 | | | | | | | | | |
| 60 | 31 | 24 | 60-62 | | | Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | | 3 | |
| 61 | | | | | | | | | |
| 62 | 32 | 24 | 62-64 | | | Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24 | 64-66 | | | Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24 | 66-68 | | | Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | | | Bentonite Seal |
| 67 | | | | | | | | | |

**REMARKS**

3. Groundwater was encountered at approximately 59.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-4/MW-4S

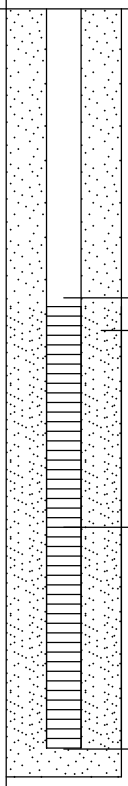
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-4/MW-4S
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 35 | 24 | 68-70 | | | Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | SAND (SP) | |
| 69 | | | | | | | | |
| 70 | 36 | 24 | 70-72 | | | Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | | |
| 71 | | | | | | | | |
| 72 | 37 | 24 | 72-74 | | | Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | | |
| 73 | | | | | | | | |
| 74 | 38 | 24 | 74-76 | | | Brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | | |
| 75 | | | | | | | | |
| 76 | | | | | | Bottom of Borehole at 76.0 Feet | 76' | 4 |
| 77 | | | | | | | | |
| 78 | | | | | | | | |
| 79 | | | | | | | | |
| 80 | | | | | | | | |
| 81 | | | | | | | | |

**Equipment Installed**




**REMARKS**

4. Monitoring well was installed in borehole upon completion. Well screen set from 71.1 to 75.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-4/MW-4S

BORING_WELL 6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5D
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Joe Workman/Adam Kittler
**Date Start/Finish:** 12-1-17 / 12-5-17
**Boring Location:**
**GS Elev.:** 779.10' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 17.5" / 12.0" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

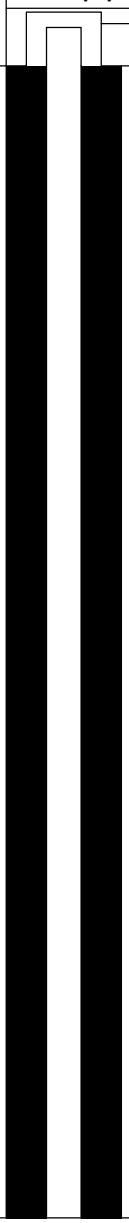
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–19 | | | | | | Blind drill from 0.0 to 20.0 feet. Cuttings observed to consist of brown, fine to medium SAND, trace Silt, damp (SP). See SB-5/MW-5S boring log detailed soil descriptions from 0.0 to 66.0 feet. | SAND (SP) (BLIND DRILL) | |
| 20 | 1 | 24/24 | 20-22 | 16/24" | 2.5 tsf | Very stiff, gray, Silty CLAY, trace fine Sand, damp (CL). | 20' Silty CLAY (CL) | 1 |
| 22 | | | | | | Blind drill from 22.0 to 69.0 feet. | 22' | 2 3 |
| 21, 23–29 | | | | | | | | |

**Equipment Installed**



PROTECTIVE CASING

**REMARKS**

1. Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate the consistency of cohesive soil.
2. Spoon driven to confirm depth of confining layer.
3. Double cased from 0.0 to 22.0 feet during drilling.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5D
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information | | | | | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5D
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | 34 | 24/20 | 69-71 | 5-7<br>9-10 | 0.0 ppm | Loose, brown, well sorted, fine SAND, trace wet (SP). | SAND (SP) | 4 | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | 35 | 24/13 | 74-76 | 7-9<br>12-17 | 0.0 ppm | Medium dense, brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | 36 | 24/18 | 79-81 | 1-3<br>4-9 | 0.0 ppm | Loose, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | 37 | 24/6 | 84-86 | 2-5<br>11-11 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Gravel, trace Silt, moist (SP). | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | 38 | 24/12 | 89-91 | 2-5<br>10-14 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Gravel, trace Silt, moist (SP). | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | Bentonite/Grout |
| 94 | 39 | 24/18 | 94-96 | 3-10<br>11-24 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | 40 | 24/24 | 99-101 | 3-4<br>10-14 | 0.0 ppm | Medim dense, pale brown, well sorted, fine | | | |

**REMARKS**

4. Field screening of samples for orgainc vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5D
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | SAND, trace Silt, trace Gravel, moist (SP). | SAND (SP) | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | 41 | 24/9 | 104-106 | 2-6 10-19 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | 42 | 24/14 | 109-111 | 4-8 18-26 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, grace Gravel, moist (SP). | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | 43 | 24/8 | 114-116 | 5-9 16-22 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | |
| 119 | 44 | 24/8 | 119-121 | 2-4 10-11 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 120 | | | | | | | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | |
| 123 | | | | | | | | | |
| 124 | 45 | 24/8 | 124-126 | 3-11 22-27 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | 46 | 24/24 | 129-131 | 3-8 17-31 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | 47 | 24/13 | 134-136 | 10-22-50/6" | 0.0 ppm | Very dense, pale brown, well sorted, fine | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5D
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | SAND, little Gravel, trace Silt, moist (SP). | SAND (SP) | | |
| 136 | | | | | | | | | |
| 137 | | | | | | | | | |
| 138 | | | | | | | | | |
| 139 | 48 | 24/14 | 139-141 | 10-23 34-35 | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, little Gravel, trace Silt, moist (SP). | | | |
| 140 | | | | | | | | | |
| 141 | | | | | | | | | |
| 142 | | | | | | | | | |
| 143 | | | | | | | | | |
| 144 | 49 | 24/6 | 144-146 | 4-7 14-21 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 145 | | | | | | | | | |
| 146 | | | | | | | | | |
| 147 | | | | | | | | | |
| 148 | | | | | | | | | |
| 149 | 50 | 24/5 | 149-151 | 1-3 8-17 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 150 | | | | | | | | | |
| 151 | | | | | | | | | |
| 152 | | | | | | | | | |
| 153 | | | | | | | | | |
| 154 | 51 | 24/3 | 154-156 | 4-22-50/6" | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 155 | | | | | | | | | |
| 156 | | | | | | | | | |
| 157 | | | | | | | | | |
| 158 | | | | | | | | | |
| 159 | 52 | 24/18 | 159-161 | 10-21 29-34 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 160 | | | | | | | | | |
| 161 | | | | | | | | | |
| 162 | | | | | | | | | |
| 163 | | | | | | | | | |
| 164 | 53 | 24/12 | 164-166 | 8-11 11-11 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Gravel, trace Silt, moist (SP). | | | |
| 165 | | | | | | | | | |
| 166 | | | | | | | | | |
| 167 | | | | | | | | | |
| 168 | | | | | | | | | |
| 169 | 54 | 24/12 | 169-171 | 3-3 3-5 | 0.0 ppm | Loose, pale brown, well sorted, fine SAND, | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL 6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

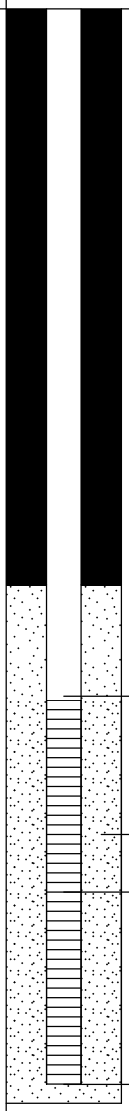
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5D
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | trace Silt, trace Gravel, moist (SP). | SAND (SP) | |
| 171, 172, 173, 174, 175 | 55 | 24/10 | 174-176 | 1-1 1-2 | 0.0 ppm | Very loose, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | |
| 176, 177, 178, 179, 180 | 56 | 24/12 | 179-181 | 1-3 1-3 | 0.0 ppm | Very loose, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | |
| 181, 182, 183, 184, 185 | 57 | 24/18 | 184-186 | 1-1 1-1 | 0.0 ppm | Very loose, pale brown, well sorted, fine SAND, little Gravel, trace Silt, moist (SP). | | |
| 186, 187, 188, 189, 190 | 58 | 24/12 | 189-191 | 1-3 10-21 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, little Gravel, trace Silt, moist (SP). | | |
| 191, 192, 193, 194, 195 | 59 | 24/8 | 194-196 | 32-38-50/4" | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, little Gravel, trace Silt, trace Cobbles, moist (SP). | | |
| 196, 197, 198, 199 | 60 | 24/0 | 198-200 | 50/0" | | NO RECOVERY. | 198' NO RECOVERY 200' | |
| 200, 201, 202, 203, 204 | | | | | | Bottom of Borehole at 200.0 | | 5 |

**Equipment Installed**




**REMARKS**

5. Monitoring well was installed in borehole upon completion. Well screen set from 188.0 to 198.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5D

BORING_WELL 6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** MW-5P
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-19-17 / 9-19-17
**Boring Location:**
**GS Elev.:** 778.90' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

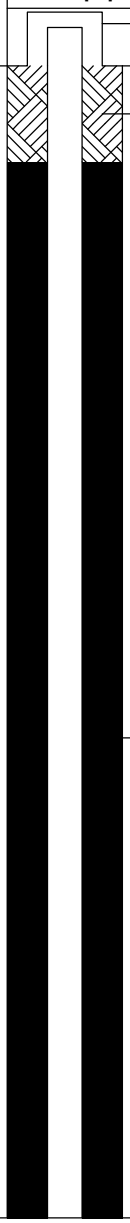
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | See SB-5/MW-5S boring log for detailed soil descriptions. | | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-5P

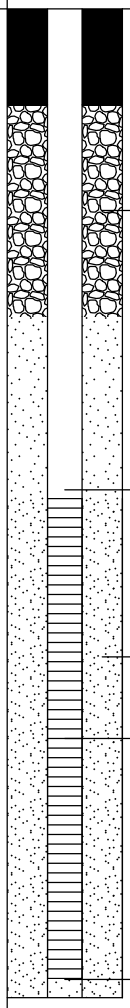
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** MW-5P
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| | | | | | | Bottom of borehole at 22.3 Feet | | 1 |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 17.1 to 21.8 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-5P

BORING_WELL 6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 1 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-19-17 / 9-19-17
**Boring Location:**
**GS Elev.:** 778.80' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

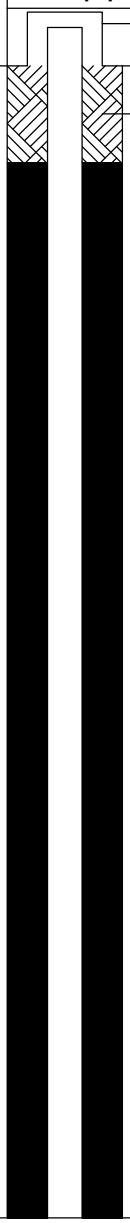
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/19 | 0-2 | 6-5<br>8-9 | | Dark yellowish-brown, fine to coarse grained SAND, little Gravel, trace Silt, poorly sorted, dry to moist (FILL). Changing at 0.4 feet to: Light yellowish-brown, fine to coarse grained SAND, trace Silt, trace Gravel, moderately sorted, moist (FILL). Changing at 0.7 feet to: Very dark grayish-brown to dark yellowish-brown, fine grained SAND, some Silt, slightly cohesive, moderately sorted, moist (FILL). Changing at 1.2 feet to: Brownish-yellow grading to pale brown to very pale brown, fine grained SAND, trace Silt, well sorted, moist (SP). | SAND (FILL) | |
| 1 | | | | | | | 1.2' SAND (SP) | |
| 2 | 2 | 24/20 | 2-4 | 4-5<br>5-5 | | | | |
| 3 | | | | | | Brownish-yellow grading to pale brown to very pale brown, fine grained SAND, trace Silt, well sorted, moist (SP). Changing at 3.2 feet to: Dark yellowish-brown to brown, fine to medium grained SAND, little Clay, little Silt, trace Gravel, slightly plastic, moderately cohesive, poorly sorted, moist (SC). Changing at 3.5 feet to: Dark yellowish-brown, CLAY & SILT, plastic, cohesive, modereately well sorted, moist (CL). | 3.5' CLAY & SILT (CL) | |
| 4 | 3 | 24/18 | 4-6 | 2-3<br>3-4 | | | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/19 | 6-8 | 2-2<br>2-3 | | Dark yellowish-brown, CLAY & SILT, plastic, cohesive, modereately well sorted, moist (CL). Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | 6' SAND (SP) | |
| 7 | | | | | | | | |
| 8 | 5 | 24/17 | 8-10 | 2-2<br>3-4 | | Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/18 | 10-12 | 3-4<br>4-6 | | Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | |
| 11 | | | | | | Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 2 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24/23 | 12-14 | 2-3<br>5-9 | | Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP).<br>Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/20 | 14-16 | 3-9<br>10-10 | | Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/20 | 16-18 | 2-4<br>4-4 | | Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP).<br>Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/19 | 18-20 | 3-5<br>5-4 | | Light yellowish-brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). Changing at 19.5 feet to: Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, moist (SP). Changing at 19.3 feet to: Dark brown to dark yellowish-brown grading to black, fine to medium grained SAND, trace Silt, well sorted, moist to wet (SP). | | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/18 | 20-22 | 3-3<br>4-3 | | Dark yellowish-brown, fine to medium grained SAND, trace Silt, wet sorted, moist to wet (SP). Changing at 20.2 feet to: Dark gray, fine to medium grained SAND, trace Silt, well sorted, wet (SP). Changing at 20.3 feet to: Reddish-gray, fine to medium grained SAND, trace Silt, well sorted, wet (SP). Changing at 20.7 feet to: Yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/23 | 22-24 | 2-5<br>8-8 | | Brown, Silty CLAY, plastic, cohesive, very well sorted, moist (CL). | 22'<br>Silty CLAY (CL) | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/20 | 24-26 | 4-6<br>6-7 | | Brown, Silty CLAY, plastic, cohesive, very well sorted, moist (CL). | | | |
| 25 | | | | | | | | | |
| | | | | | | | 26' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 3 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/17 | 26-28 | 3-5<br>8-9 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/18 | 28-30 | 4-6<br>8-9 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | Bentonite/Grout |
| 29 | | | | | | | | | |
| 30 | 16 | 24/24 | 30-32 | 5-6<br>9-10 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/18 | 32-34 | 3-5<br>9-13 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/18 | 34-36 | 3-7<br>13-16 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/19 | 36-38 | 3-7<br>10-10 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/24 | 38-40 | 3-5<br>8-12 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 4 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/22 | 40-42 | 3-5<br>11-16 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/24 | 42-44 | 3-11<br>18-21 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/20 | 44-46 | 5-10<br>14-17 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/24 | 46-48 | 4-7<br>9-9 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/20 | 48-50 | 3-8<br>11-15 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/24 | 50-52 | 3-10<br>17-18 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/22 | 52-54 | 9-13<br>21-25 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

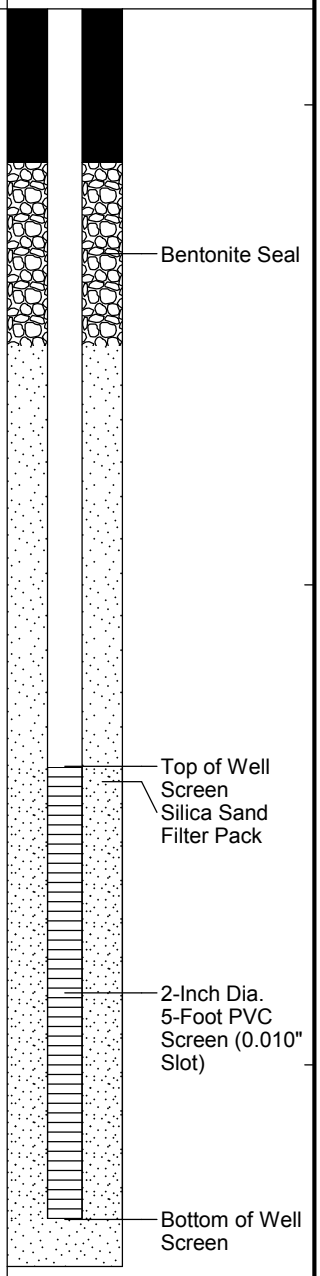
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 5 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 28 | 24/24 | 54-56 | 4-5<br>8-10 | | Pale brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). Changing at 54.5 feet to: Brown to yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | SAND (SP) | 1 |
| 55 | | | | | | | | |
| 56 | 29 | 24/24 | 56-58 | 3-4<br>5-6 | | Brown to yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | |
| 57 | | | | | | | | |
| 58 | 30 | 24/16 | 58-60 | 2-3<br>5-5 | | Brown to yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | |
| 59 | | | | | | | | |
| 60 | 31 | 24/16 | 60-62 | 1-1<br>2-2 | | Brown to yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP).<br>Brown to yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | |
| 61 | | | | | | | | |
| 62 | 32 | 24/5 | 62-64 | 1-4<br>7-11 | | Brown to yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | |
| 63 | | | | | | | | |
| 64 | 33 | 24/11 | 64-66 | 2-6<br>10-10 | | Brown to yellowish-brown, fine to medium grained SAND, trace Silt, well sorted, wet (SP). | | |
| 65 | | | | | | | | |
| 66 | | | | | | | 66' | |
| 67 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Groundwater was encountered at approximately 54.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 6 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 69 | 34 | 24/20 | 69-71 | 5-7<br>9-10 | 0.0 ppm | Loose, brwn, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | 35 | 24/13 | 74-76 | 7-9<br>12-17 | 0.0 ppm | Medium dense, brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | 36 | 24/18 | 79-81 | 1-3<br>4-9 | 0.0 ppm | Loose, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 7 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 83 | | | | | | | | | |
| 84 | 37 | 24/6 | 84-86 | 2-5 11-11 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Gravel, trace Silt, moist (SP). | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | 38 | 24/12 | 89-91 | 2-5 10-14 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Gravel, trace Silt, moist (SP). | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | 39 | 24/18 | 94-96 | 3-10 11-24 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 95 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 8 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | 40 | 24/24 | 99-101 | 3-4<br>10-14 | 0.0 ppm | Medim dense, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | 41 | 24/9 | 104-106 | 2-6<br>10-19 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | 42 | 24/14 | 109-111 | 4-8<br>18-26 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, grace Gravel, moist (SP). | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 9 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | 43 | 24/8 | 114-116 | 5-9<br>16-22 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | |
| 119 | 44 | 24/8 | 119-121 | 2-4<br>10-11 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 120 | | | | | | | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | |
| 123 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 10 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 45 | 24/8 | 124-126 | 3-11 22-27 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | 46 | 24/24 | 129-131 | 3-8 17-31 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | 47 | 24/13 | 134-136 | 10-22-50/6" | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, little Gravel, trace Silt, moist (SW). | | | |
| 135 | | | | | | | | | |
| 136 | | | | | | | | | |
| 137 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 11 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 139 | 48 | 24/14 | 139-141 | 10-23<br>34-35 | 0.0 ppm | Dense, pale brown, well sorted, fine SAND, little Gravel, trace Silt, moist (SW). | | | |
| 140 | | | | | | | | | |
| 141 | | | | | | | | | |
| 142 | | | | | | | | | |
| 143 | | | | | | | | | |
| 144 | 49 | 24/6 | 144-146 | 4-7<br>14-21 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 145 | | | | | | | | | |
| 146 | | | | | | | | | |
| 147 | | | | | | | | | |
| 148 | | | | | | | | | |
| 149 | 50 | 24/5 | 149-151 | 1-3<br>8-17 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 150 | | | | | | | | | |
| 151 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 12 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 153 | | | | | | | | | |
| 154 | 51 | 24/3 | 154-156 | 4-22-50/6" | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 155 | | | | | | | | | |
| 156 | | | | | | | | | |
| 157 | | | | | | | | | |
| 158 | | | | | | | | | |
| 159 | 52 | 24/18 | 159-161 | 10-21<br>29-34 | 0.0 ppm | Dense, plae brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 160 | | | | | | | | | |
| 161 | | | | | | | | | |
| 162 | | | | | | | | | |
| 163 | | | | | | | | | |
| 164 | 53 | 24/12 | 164-166 | 8-11<br>11-11 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, trace Gravel, trace Silt, moist (SP). | | | |
| 165 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 13 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 167 | | | | | | | | | |
| 168 | | | | | | | | | |
| 169 | 54 | 24/12 | 169-171 | 3-3<br>3-5 | 0.0 ppm | Loose, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 170 | | | | | | | | | |
| 171 | | | | | | | | | |
| 172 | | | | | | | | | |
| 173 | | | | | | | | | |
| 174 | 55 | 24/10 | 174-176 | 1-1<br>1-2 | 0..0 ppm | Very loose, pale brown, well sorted, fine SAND, trace Silt, moist (SP). | | | |
| 175 | | | | | | | | | |
| 176 | | | | | | | | | |
| 177 | | | | | | | | | |
| 178 | | | | | | | | | |
| 179 | 56 | 24/12 | 179-181 | 3-3<br>3-3 | 0.0 ppm | Very loose, pale brown, well sorted, fine SAND, trace Silt, trace Gravel, moist (SP). | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 14 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 181 | | | | | | | | | |
| 182 | | | | | | | | | |
| 183 | | | | | | | | | |
| 184 | 57 | 24/18 | 184-186 | 1-1<br>1-1 | 0.0 ppm | Very loose, pale brown, well sorted, fine SAND, little Gravel, trace Silt, moist (SW). | | | |
| 185 | | | | | | | | | |
| 186 | | | | | | | | | |
| 187 | | | | | | | | | |
| 188 | | | | | | | | | |
| 189 | 58 | 24/12 | 189-191 | 1-3<br>10-21 | 0.0 ppm | Medium dense, pale brown, well sorted, fine SAND, little Gravel, trace Silt, moist (SW). | | | |
| 190 | | | | | | | | | |
| 191 | | | | | | | | | |
| 192 | | | | | | | | | |
| 193 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-5/MW-5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-5/MW-5S
**Page:** 15 **of** 15
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 59 | 24/8 | 194-196 | 32-38-50/4" | 0.0 ppm | Very dense, pale brown, well sorted, fine SAND, little Gravel, trace Silt, trace Cobbles, moist (SP). | | | |
| 195 | | | | | | | | | |
| 196 | | | | | | | | | |
| 197 | | | | | | | | | |
| 198 | 60 | 24/0 | 198-200 | 50/0" | | NO RECOVERY. | | | |
| 199 | | | | | | | | | |
| 200 | | | | | | Bottom of Borehole at 200.0 | | 2 | |
| 201 | | | | | | | | | |
| 202 | | | | | | | | | |
| 203 | | | | | | | | | |
| 204 | | | | | | | | | |
| 205 | | | | | | | | | |
| 206 | | | | | | | | | |
| 207 | | | | | | | | | |

**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from 61.9 to 66.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6D/MW-6D
**Page:** 1 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Julie Groenleer
**Date Start/Finish:** 10-31-17 / 11-2-17
**Boring Location:**
**GS Elev.:** 770.60' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

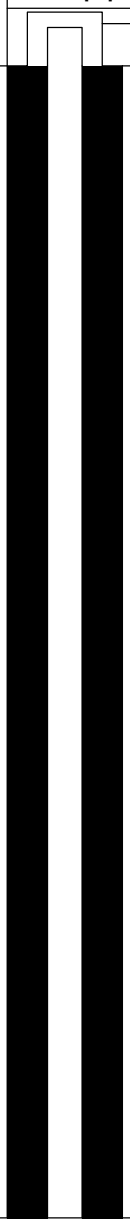
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See SB-6/MW-6S for soil description from 0.0 to 70.0 feet. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6D/MW-6D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6D/MW-6D
**Page:** 2 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information | | | | | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6D/MW-6D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6D/MW-6D
**Page:** 3 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | 1 | 24/18 | 70-72 | 1-2<br>4-12 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | SAND (SP) | | |
| 71 | | | | | | | | | |
| 72 | 2 | 24/13 | 72-74 | 2-3<br>11-17 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 73 | | | | | | | | | |
| 74 | 3 | 24/1 | 74-76 | 7-11<br>19-18 | | Medium dense, light brown, fine Silty SAND, wet (SM). | 74'<br>Silty SAND (SM) | | |
| 75 | | | | | | | | | |
| 76 | 4 | 24/4 | 76-78 | 2-3<br>3-8 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | 76'<br>SAND (SP) | | Bentonite/Grout |
| 77 | | | | | | | | | |
| 78 | 5 | 24/12 | 78-80 | 4-7<br>15-18 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 79 | | | | | | | | | |
| 80 | 6 | 24/20 | 80-82 | 2-6<br>17-25 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 81 | | | | | | | | | |
| 82 | 7 | 24/16 | 82-84 | 2-2<br>4-8 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 83 | | | | | | | | | |
| 84 | 8 | 24/12 | 84-86 | 2-2<br>2-7 | | Very loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 85 | | | | | | | | | |
| 86 | 9 | 24/20 | 86-88 | 5-16<br>37-35 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 87 | | | | | | | | | |
| 88 | 10 | 24/13 | 88-90 | 5-6<br>56-50 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 89 | | | | | | | | | |
| 90 | 11 | 24/24 | 90-92 | 6-17<br>60-30 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 91 | | | | | | | | | |
| 92 | 12 | 24/0 | 92-94 | 4-7<br>10-11 | | NO RECOVERY. | 92'<br>NO RECOVERY | | |
| 93 | | | | | | | | | |
| 94 | 13 | 24/0 | 94-96 | 2-3<br>4-11 | | NO RECOVERY. | | | |
| 95 | | | | | | | | | |
| 96 | 14 | 24/24 | 96-98 | 2-7<br>9-24 | | Medium dense, brown, fine SAND, trace medium Sand, trace Silt, wet (SP). | 96'<br>SAND (SP) | | |
| 97 | | | | | | | | | |
| 98 | 15 | 24/24 | 98-100 | 3-6<br>13-22 | | Medium dense, brown, fine SAND, trace medium Sand, trace Silt, wet (SP). Changing at 99.6 feet to: Medium dense, | 99.6' | | |
| 99 | | | | | | | 100' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6D/MW-6D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6D/MW-6D
**Page:** 4 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 16 | 24/11 | 100-102 | 3-8 20-31 | | brown, fine Silty SAND, wet (SM). Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | Silty SAND (SM) / SAND (SP) | | |
| 101 | | | | | | | | | |
| 102 | 17 | 24/18 | 102-104 | 2-3 10-15 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 103 | | | | | | | | | |
| 104 | 18 | 24/6 | 104-106 | 5-10 23-22 | | Dense, brown, fine Silty SAND, wet (SM). | 104' Silty SAND (SM) | | |
| 105 | | | | | | | | | |
| 106 | 19 | 24/17 | 106-108 | 9-19 29-29 | | Dense, brown, fine Silty SAND, wet (SM). | | | |
| 107 | | | | | | | | | |
| 108 | 20 | 24/12 | 108-110 | 5-12 18-18 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 108' SAND (SP) | | |
| 109 | | | | | | | | | |
| 110 | 21 | 24/13 | 110-112 | 2-3 5-17 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 111 | | | | | | | | | |
| 112 | 22 | 24/0 | 112-114 | 3-4 7-12 | | NO RECOVERY. | 112' NO RECOVERY | | |
| 113 | | | | | | | | | |
| 114 | 23 | 24/0 | 114-116 | 3-5 15-17 | | NO RECOVERY. | | | |
| 115 | | | | | | | | | |
| 116 | 24 | 24/0 | 116-118 | 4-13 30-45 | | NO RECOVERY (bailed for sample description: Brown, fine to medium SAND, trace Silt, moist (SP)). | 116' NO RECOVERY (bailed for sample description: SAND (SP)) | | |
| 117 | | | | | | | | | |
| 118 | 25 | 24/10 | 118-120 | 9-29 46-54 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | 118' SAND (SP) with Silty SAND in spoon at 120.0 feet | | |
| 119 | | | | | | | | | |
| 120 | 26 | 24/8 | 120-122 | 6-7 9-19 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 121 | | | | | | | | | |
| 122 | 27 | 24/24 | 122-124 | 10-22 37-39 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 123 | | | | | | | | | |
| 124 | 28 | 24/24 | 124-126 | 6-21 28-28 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 125 | | | | | | | | | |
| 126 | 29 | 24/24 | 126-128 | 11-19 33-24 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 127 | | | | | | | | | |
| 128 | 30 | 24/12 | 128-130 | 3-3 3-10 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 129 | | | | | | | | | |
| 130 | 31 | 24/24 | 130-132 | 8-25 35-17 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 131 | | | | | | | | | |
| 132 | 32 | 24/14 | 132-134 | 12-29 44-50 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 133 | | | | | | | | | |
| 134 | 33 | 24/20 | 134-136 | 2-7 30-50 | | Dense, brown, fine to medium SAND, trace | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

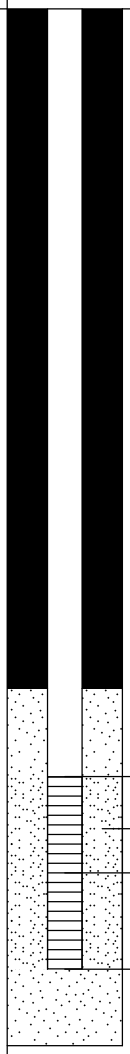
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6D/MW-6D
**Page:** 5 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Silt, wet (SP). | SAND (SP) with Silty SAND in spoon at 120.0 feet | |
| 136–137 | 34 | 24/19 | 136-138 | 2-4 12-21 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 138–139 | 35 | 24/14 | 138-140 | 8-11 11-14 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 140–141 | 36 | 24/12 | 140-142 | 5-11 23-24 | | Dense, brown, fine to medium SAND, trace Silt, trace fine Gravel, wet (SP). | | |
| 142–143 | 37 | 24/12 | 142-144 | 4-8 12-18 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 144–145 | 38 | 24/10 | 144-146 | 1-3 12-17 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 146–147 | 39 | 24/8 | 146-148 | 1-2 4-8 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 148–149 | 40 | 24/9 | 148-150 | 1-3 7-14 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 150–151 | 41 | 24/7 | 150-152 | 1-2 5-7 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 152–153 | 42 | 24/0 | 152-154 | 3-7 20-32 | | NO RECOVERY. | 152' NO RECOVERY | |
| 154–155 | 43 | 24/24 | 154-156 | 3-8 18-32 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 154' SAND (SP) | |
| 156–157 | 44 | 24/14 | 156-158 | 5-12 47-24 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 158–159 | 45 | 24/24 | 158-160 | 3-12 29-36 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). Changing at 160.0 feet (in shoe) to: Very stiff, gray, CLAY & SILT, some fine Sand, moist (CL). | | |
| 160–161 | 46 | 24/24 | 160-162 | 1-9 23-36 | 3.75 tsf >4.0 tsf | Hard, gray, CLAY & SILT, some fine to coarse Sand, moist (CL). | 160' CLAY & SILT (CL) 162' | |
| 162 | | | | | | Bottom of Borehole at 162.0 Feet | | |

**Equipment Installed**




**REMARKS**

Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate consistency of cohesive soil.
Monitoring well was installed in borehole upon completion. Well screen set from 155.0 to 160.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6D/MW-6D

BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6/MW-6S
**Page:** 1 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-13-17 / 9-14-17
**Boring Location:**
**GS Elev.:** 770.30' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

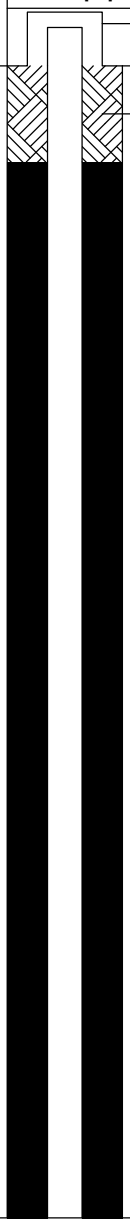
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/18 | 0-2 | 4-3<br>3-5 | | Very dark grayish-brown to dark brown, fine to medium grained SAND, some Silt, poorly sorted, dry (SM). Changing at 0.2 feet to: Dark brown, fine to medium grained SAND, some Silt, moderately sorted, dry (SM). Changing at 0.4 feet to: Dark yellowish-brown,fine to medium grained SAND, some Silt, trace Gravel, moderately sorted, dry (SM). | SAND (SM) | |
| 1 | | | | | | | | |
| 2 | 2 | 24/16 | 2-4 | 8-8<br>11-12 | | Dark yellowish-brown,fine to medium grained SAND, some Silt, trace Gravel, moderately sorted, dry (SM). Changing at 2.8 feet to: Dark yellowish-brown, fine to medium SAND, little Clay, little Silt, non to slightly plastic, moderately cohesive, poorly sorted, dry (SC). Changing at 3.0 feet to: Mottled dark yellowish-brown to pale brown, CLAY & SILT, some Sand, trace Gravel, plastic, cohesive, poorly sorted, dry to moist (CL). | 2.8'<br>3' SAND (SC)<br>CLAY & SILT (CL) | |
| 3 | | | | | | | | |
| 4 | 3 | 24/19 | 4-6 | 8-9<br>13-15 | | | | |
| 5 | | | | | | Mottled dark yellowish-brown to pale brown, CLAY & SILT, some Sand, trace Gravel, plastic, cohesive, poorly sorted, dry to moist (CL). Changing at 5.2 feet to: Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | 5.2'<br>SAND (SP) | |
| 6 | 4 | 24/14 | 6-8 | 2-2<br>2-2 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | |
| 7 | | | | | | | | |
| 8 | 5 | 24/20 | 8-10 | 1-3<br>3-4 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/24 | 10-12 | 2-3<br>3-5 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | |
| 11 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6/MW-6S

BORING_WELL_6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6/MW-6S
**Page:** 2 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24/22 | 12-14 | 3-4<br>5-5 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/20 | 14-16 | 2-5<br>6-11 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist with some alternating beds of dark yellowish-brown, fine to medium grained SAND, trace Gravel at 14.6 feet. | | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/22 | 16-18 | 4-8<br>9-10 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/22 | 18-20 | 4-5<br>7-8 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/19 | 20-22 | 6-9<br>14-15 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/24 | 22-24 | 6-10<br>11-13 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/20 | 24-26 | 5-8<br>13-18 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 25 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6/MW-6S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6/MW-6S
**Page:** 3 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/22 | 26-28 | 7-10<br>15-18 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | Bentonite/Grout |
| 27 | | | | | | | | | |
| 28 | 15 | 24/22 | 28-30 | 7-11<br>12-14 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/20 | 30-32 | 7-14<br>15-17 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/16 | 32-34 | 7-10<br>15-21 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/22 | 34-36 | 6-10<br>18-20 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/19 | 36-38 | 10-16<br>23-34 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). Changing at 36.8 feet to: Light yellowish-brown, fine grained SAND, little Silt, very well sorted, moist (SM). Changing at 37.8 feet to: Light yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, well sorted, moist (SP). | 36.8'<br>SAND (SM)<br>37.8'<br>SAND (SP) | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/19 | 38-40 | 9-22<br>22-20 | | Light yellowish-brown to pale brown, fine to medium grained SAND, trace Silt, well sorted, moist (SP). Changing at 38.5 feet to: Light yellowish-brown, fine grained SAND, little Silt, very well sorted, moist (SM). | 38.5'<br>SAND (SM) | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6/MW-6S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6/MW-6S
**Page:** 4 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/24 | 40-42 | 4-6<br>7-3 | | Light yellowish-brown, fine grained SAND, little Silt, very well sorted, moist (SM). Changing at 40.9 feet to: Yellowish-brown, fine grained SAND, little Silt, well sorted, moist (SM). | SAND (SM) | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/19 | 42-44 | 11-22<br>37-38 | | Yellowish-brown, fine grained SAND, little Silt, well sorted, moist (SM). Changing at 43.1 feet to: Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). | | | |
| 43 | | | | | | | 43.1'<br>SAND (SP) | | |
| 44 | 23 | 24/22 | 44-46 | 16-22<br>28-30 | | Very pale brown, fine to medium SAND, trace Silt, very well sorted, moist (SP). Changing at 44.8 feet to: Brown, fine to medium grained SAND, trace Silt, well sorted, moist (SP). | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/22 | 46-48 | 6-8<br>10-11 | | Brown, fine to medium grained SAND, trace Silt, trace Gravel, well sorted, wet (SP). | | 1 | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/18 | 48-50 | 4-11<br>18-21 | | Brown, fine to medium grained SAND, trace Silt, trace Gravel, well sorted, wet (SP). | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/18 | 50-52 | 5-11<br>14-17 | | Brown, fine to medium grained SAND, trace Silt, trace Gravel, well sorted, wet (SP). | | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/11 | 52-54 | 3-9<br>18-21 | | Brown, fine to medium grained SAND, trace Silt, trace Gravel, well sorted, wet (SP). | | | Bentonite Seal |
| 53 | | | | | | | | | |

**REMARKS**

1. Groundwater was encountered at approximately 46.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6/MW-6S

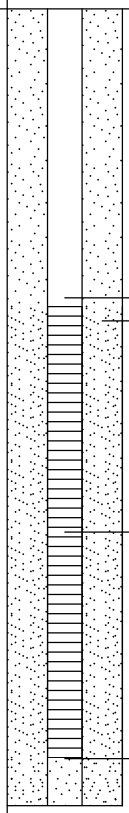
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-6/MW-6S
**Page:** 5 **of** 5
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 28 | 24/20 | 54-56 | 3-8<br>14-15 | | Brown, fine to medium grained SAND, trace Silt, trace Gravel, well sorted, wet (SP). | SAND (SP) | |
| 55 | | | | | | | | |
| 56 | 29 | 24/8 | 56-58 | 2-4<br>12-12 | | Brown, fine to medium grained SAND, trace Silt, trace Gravel, well sorted, wet (SP). | | |
| 57 | | | | | | | | |
| 58 | 30 | 24/12 | 58-60 | 3-7<br>12-11 | | Brown, fine to medium grained SAND, trace Silt, trace Gravel, well sorted, wet (SP). | | |
| 59 | | | | | | | | |
| 60 | 31 | 24/7 | 60-62 | 1-1<br>3-7 | | Brown, fine to medium grained SAND, trace Silt, trace Gravel, well sorted, wet (SP). | | |
| 61 | | | | | | | | |
| 62 | | | | | | Bottom of Borehole at 62.0 Feet | 62' | 2 |
| 63 | | | | | | | | |
| 64 | | | | | | | | |
| 65 | | | | | | | | |
| 66 | | | | | | | | |
| 67 | | | | | | | | |

**Equipment Installed**




**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from 57.1 to 61.8 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-6/MW-6S

BORING_WELL 6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-7/MW-7S
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 9-19-17 / 9-20-17
**Boring Location:**
**GS Elev.:** 788.90' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30.0" | NA |
| **TOC Elev.:** | NA | NA |

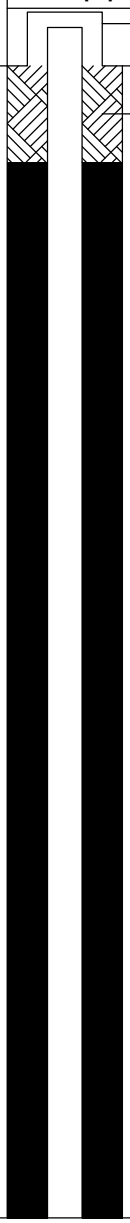
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/18 | 0-2 | 2-1<br>2-1 | | Very loose, dark brown to yellowish-brown, fine grained SAND, some Silt, moderately sorted, dry (TOPSOIL). Changing at 0.5 feet to: Brownish-yellow, fine grained SAND, little Silt, well sorted, dry (SM). | SAND (TOPSOIL)<br>0.5'<br>SAND (SM) | |
| 1 | | | | | | | | |
| 2 | 2 | 24/12 | 2-4 | 2-3<br>3-4 | | Loose, yellowish-brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | 2'<br>SAND (SP) | |
| 3 | | | | | | | | |
| 4 | 3 | 24/18 | 4-6 | 2-2<br>3-2 | | Loose, yellowish-brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/5 | 6-8 | 2-2<br>2-2 | | Loose, yellowish-brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP) with fractured rock at 6.1 feet. Changing at 6.3 feet to: Dark brown, CLAY & SILT, some Sand, trace Gravel, plastic, cohesive, mmoist (CL). | 6.3'<br>CLAY & SILT (CL) | |
| 7 | | | | | | | | |
| 8 | 5 | 24/12 | 8-10 | 2-2<br>3-4 | | Loose dark grayish-brown to dark brown, coarse grained SAND, little Gravel, trace Silt, poorly sorted, moist (SP). | 8'<br>SAND (SP) | |
| 9 | | | | | | | | |
| 10 | 6 | 24/11 | 10-12 | 4-6<br>4-4 | | Loose dark grayish-brown to dark brown, coarse grained SAND, little Gravel, trace Silt, poorly sorted, moist (SP). | | |
| 11 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-7/MW-7S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-7/MW-7S
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24/19 | 12-14 | 4-7<br>5-5 | | Loose dark grayish-brown to dark brown, coarse grained SAND, little Gravel, trace Silt, poorly sorted, moist (SP). Changing at 12.6 feet to: Stiff, brown, CLAY & SILT, some Sand, trace Gravel, plastic, cohesive, poorly sorted, moist (CL). Changing at 13.2 feet to: Stiff, dark brown, CLAY & SILT, some Sand, trace Gravel, plastic, cohesive, poorly sorted, moist (CL). | SAND (SP)<br>12.6'<br>CLAY & SILT (CL)<br>13'<br>13.2' SAND (SM)<br>CLAY & SILT (CL) | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/0 | 14-16 | 8-8<br>9-10 | | NO RECOVERY. | | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/17 | 16-18 | 3-4<br>3-5 | | Loose, brown, fine grained SAND, trace Silt, very well sorted, moist (SP). Changing at 16.4 feet to: Medium brown, CLAY & SILT, some Sand, trace Gravel, moderately plastic, cohesive, poorly sorted, moist (CL). Changing at 16.7 feet to: Loose, dark yellowish-brown, fine grained SAND, trace Silt, well sorted, moist (SP). Changing at 17.0 feet to: Medium mottled yellowish-brown, CLAY & SILT, plastic, cohesive, well sorted, moist (CL). | 16'<br>SAND (SP)<br>16.4'<br>CLAY & SILT (CL)<br>16.7'<br>17' SAND (SP)<br>CLAY & SILT (CL) | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/22 | 18-20 | 4-4<br>5-6 | | Medium mottled yellowish-brown, CLAY & SILT, plastic, cohesive, well sorted, moist (CL). Changing at 18.6 feet to: Stiff mottled yellowish-brown, CLAY & SILT, plastic, cohesive, well sorted, moist (CL). Changing at 18.9 feet to: Loose, light yellowish-brown to brownish-yellow, fine grained SAND, very well sorted, moist (SP). Changing at 19.0 feet to: Stiff, mottled yellowish-brown, CLAY & SILT, plastic, cohesive, well sorted, moist (CL). | 18.9'<br>19' SAND (SP)<br>CLAY & SILT (CL) | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/14 | 20-22 | 3-3<br>4-5 | | Stiff, mottled yellowish-brown, CLAY & SILT, plastic, cohesive, well sorted, moist (CL). | 20.6'<br>SAND (SP) | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/16 | 22-24 | 1-1<br>2-3 | | Loose to medium dense, very pale brown, fine grained SAND, trace Silt, very well sorted (bedded), moist (SP). | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/22 | 24-26 | 2-3<br>3-2 | | Loose to medium dense, very pale brown, fine grained SAND, trace Silt, very well sorted (bedded), moist (SP). | | | |
| 25 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-7/MW-7S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-7/MW-7S
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/22 | 26-28 | 2-3<br>3-3 | | Loose to medium dense, very pale brown, fine grained SAND, trace Silt, very well sorted (bedded), moist (SP). | SAND (SP) | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/22 | 28-30 | 2-3<br>4-3 | | Loose to medium dense, very pale brown, fine grained SAND, trace Silt, very well sorted (bedded), moist (SP). | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/20 | 30-32 | 1-3<br>6-8 | | Loose to medium dense, very pale brown, fine grained SAND, trace Silt, very well sorted (bedded), moist (SP). Changing at 30.3 feet to: Stiff, yellowish-brown, SILT, little Clay, plastic, cohesive, well sorted, moist to wet (ML). Changing at 30.7 feet to: Medium dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted (bedded), moist (SP). | 30.3'<br>SILT (ML)<br>30.7'<br>SAND (SP) | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/23 | 32-34 | 5-5<br>7-8 | | Medium dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted (bedded), moist (SP). Changing at 32.7 feet to: Soft, dark yellowish-brown, CLAY & SILT, plastic, cohesive, moist (CL). Changing at 32.8 feet to: Medium dense, very pale brown, fine to coarse grained SAND, some Gravel, trace Silt, poorly sorted, moist (SP). | 32.7'<br>32.8'<br>CLAY & SILT (CL)<br>SAND (SP) | | Bentonite/Grout |
| 33 | | | | | | | | | |
| 34 | 18 | 24/20 | 34-36 | 4-8<br>9-8 | | Medium dense, very pale brown, fine to coarse grained SAND, some Gravel, trace Silt, moderately sorted, moist (SP). | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/18 | 36-38 | 5-6<br>7-8 | | Medium dense, very pale brown, fine to coarse grained SAND, some Gravel, trace Silt, moderately sorted, moist (SP). Changing at 36.1 feet to: Brown to yellowish-brown, CLAY & SILT, plastic, cohesive, well sorted (bedded), moist (CL). Changing at 36.2 feet to: Medium dense, very pale brown, fine to coarse grained SAND, some Gravel, trace Silt, moderately sorted, moist (SP). | 36.1'<br>36.2'<br>CLAY & SILT (CL)<br>SAND (SP) | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/18 | 38-40 | 3-5<br>5-7 | | Medium dense, very pale brown, fine to coarse grained SAND, some Gravel, trace Silt, moderately sorted, moist (SP). Changing at 38.5 feet to: Medium dense, light yellowish-brown to very pale brown, fine to medium grained SAND, trace Silt, | | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-7/MW-7S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-7/MW-7S
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/20 | 40-42 | 2-4<br>7-8 | | very well sorted, moist (SP).<br>Medium dense, light yellowish-brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/16 | 42-44 | 4-4<br>6-10 | | Medium dense, light yellowish-brown to very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). Changing at 42.9 feet to: Medium dense, light yellowish-brown, fine to coarse grained SAND, some Gravel, trace Silt, poorly sorted, moist (SP). | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/20 | 44-46 | 3-5<br>6-9 | | Medium dense, light yellowish-brown, fine to coarse grained SAND, trace Silt, poorly sorted, moist (SP). Changing at 45.3 feet to: Stiff to very stiff yellowish-brown grading to dark gray, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, poorly sorted, moist (CL). | | | |
| 45 | | | | | | | 45.3'<br>CLAY & SILT (CL) | | |
| 46 | 24 | 24/12 | 46-48 | 3-6<br>7-10 | | Stiff to very stiff yellowish-brown grading to dark gray, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, poorly sorted, moist (CL). | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/18 | 48-50 | 10-11<br>29-17 | | Stiff to very stiff yellowish-brown grading to dark gray, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, poorly sorted, moist (CL). Changing 48.6 feet to: Dense to very dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | 48.6'<br>SAND (SP) | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/6 | 50-52 | 21-39<br>48-25 | | Dense to very dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/23 | 52-54 | 6-12<br>16-20 | | Dense to very dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-7/MW-7S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-7/MW-7S
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 28 | 24/20 | 54-56 | 6-16 17-23 | | Dense to very dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | SAND (SP) | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/23 | 56-58 | 6-13 17-21 | | Dense to very dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24/20 | 58-60 | 8-16 20-31 | | Dense to very dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 59 | | | | | | | | | |
| 60 | 31 | 24/24 | 60-62 | 9-17 18-24 | | Dense to very dense, very pale brown, fine to medium grained SAND, trace Silt, very well sorted, moist (SP). | | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/18 | 62-64 | 4-8 10-11 | | Medium dense, yellowish-brown, fine to medim grained SAND, trace Silt, well sorted, wet (SP). | | 1 | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/23 | 64-66 | 2-3 7-10 | | Medium dense, yellowish-brown, fine to medim grained SAND, trace Silt, well sorted, wet (SP). | | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/1 | 66-68 | 1-3 5-9 | | Medium dense, yellowish-brown, fine to medim grained SAND, trace Silt, well sorted, wet (SP). | | | Bentonite Seal |
| 67 | | | | | | | | | |

**REMARKS**

1. Groundwater was encountered at approximately 62.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-7/MW-7S

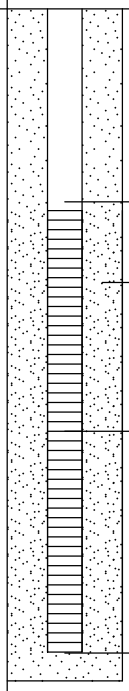
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1855 House Street NE
Belmont, Michigan

**Boring No.:** SB-7/MW-7S
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** J Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 35 | 24/23 | 68-70 | 1-4<br>7-7 | | Medium dense, yellowish-brown, fine to medim grained SAND, trace Silt, well sorted, wet (SP). | SAND (SP) | |
| 69 | | | | | | | | |
| 70 | 36 | 24/8 | 70-72 | 2-7<br>11-11 | | Medium dense, yellowish-brown, fine to medim grained SAND, trace Silt, well sorted, wet (SP). | | |
| 71 | | | | | | | | |
| 72 | 37 | 24/5 | 72-74 | 1-2<br>5-9 | | Medium dense, yellowish-brown, fine to medim grained SAND, trace Silt, well sorted, wet (SP). | | |
| 73 | | | | | | | | |
| 74 | | | | | | Bottom of Borehole at 74.0 Feet | 74' | 2 |
| 75 | | | | | | | | |
| 76 | | | | | | | | |
| 77 | | | | | | | | |
| 78 | | | | | | | | |
| 79 | | | | | | | | |
| 80 | | | | | | | | |
| 81 | | | | | | | | |

**Equipment Installed**




**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from 70.1 to 74.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-7/MW-7S

BORING_WELL 6233550 WWW HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
1758 House Street NE
Belmont, Michigan

**Boring No.:** SB-8/MW-8
**Page:** 1 **of** 3
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehosue
**Date Start/Finish:** 10-30-17 / 10-30-17
**Boring Location:**
**GS Elev.:** 742.20' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

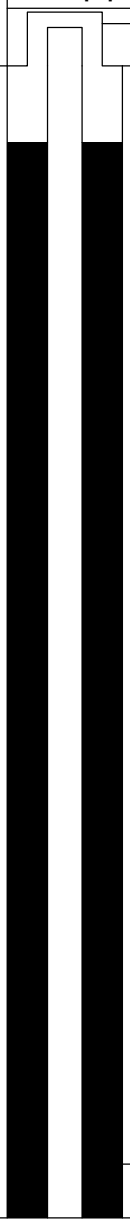
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/20 | 0-2 | 1-1<br>1-3 | | Very loose, very dark grayish-brown, well sorted, fine grained SAND, little silt, slightly cohesive, moist (SM). Changing at 0.9 feet to: Very loose, yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). | SAND (SM)<br>0.9'<br>SAND (SP) | |
| 2 | 2 | 24/6 | 2-4 | 2-2<br>2-1 | | Very loose, yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | |
| 4 | 3 | 24/15 | 4-6 | 2-2<br>2-1 | | Very loose, yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | |
| 6 | 4 | 24/17 | 6-8 | 2-3<br>4-6 | | Loose, yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | |
| 8 | 5 | 24/19 | 8-10 | 3-5<br>5-7 | | Loose, yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). Changing at 8.5 feet to: Loose, dark yellowish-brown, well sorted, fine grained SAND, little Silt, slightly cohesive, moist (SM). Changing at 8.8 feet to: Loose, light yellowish-brown to brownish-yellow, well sorted, fine to medium grained SAND, trace Silt, moist (SP). Changing at 8.9 feet to: Dark yellowish-brown, moderately well sorted, CLAY & SILT, little Sand, moderately plastic, cohesive, moist (CL). Changing at 9.1 feet to: Loose, light yellowish-brown to brownish-yellow, well sorted, fine to medium grained SAND, trace Silt, moist (SP). Changing at 9.3 feet to: Dark yellowish-brown, moderately well sorted, CLAY & SILT, little Sand, moderately plastic, cohesive, moist (CL). Medium dense, brown, well sorted, fine to medium grained SAND, little Silt, slightly cohesive, moist (SM). Changing at 10.8 feet to: Medium dense, dark yellowish-brown, | 8.5'<br>8.8' SAND (SM)<br>8.9' SAND (SP)<br>9.1' CLAY & SILT (CL)<br>9.3' SAND (SP)<br>10' CLAY & SILT (CL)<br>SAND (SM)<br>10.8'<br>SAND (SP) | |
| 10 | 6 | 24/18 | 10-12 | 6-6<br>5-5 | | | | |
| 12 | 7 | 24/17 | 12-14 | 3-3<br>4-4 | | | | |
| 14 | 8 | 24/17 | 14-16 | 3-3<br>4-5 | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-8/MW-8

BORING_WELL_6233552 WWW 1758 HOUSE STREET NE.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1758 House Street NE
Belmont, Michigan

**Boring No.:** SB-8/MW-8
**Page:** 2 **of** 3
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | very well sorted, fine to medium grained SAND, trace Silt, moist (SP). | SAND (SP) | | |
| 16 | 9 | 24/18 | 16-18 | 3-4<br>5-5 | | Loose, dark yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | | |
| 17 | | | | | | Loose, yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | | |
| 18 | 10 | 24/19 | 18-20 | 4-4<br>4-4 | | Loose, dark yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | | |
| 19 | | | | | | Dark yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | | |
| 20 | 11 | 24/16 | 20-22 | 2-2<br>2-3 | | Very loose, brown to yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | 1 | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/18 | 22-24 | 1-3<br>2-2 | | Very loose, brown to yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/19 | 24-26 | 1-0<br>0-0 | | Very loose, brown to yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/18 | 26-28 | 0-0<br>0-1 | | Very loose, brown to yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/6 | 28-30 | 0-0<br>0-3 | | Very loose, brown to yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | Top of Well Screen |
| 29 | | | | | | | | | |
| 30 | 16 | 24/18 | 30-32 | 0-1<br>0-1 | | Very loose, brown to yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | Silica Sand Filter Pack<br>2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 31 | | | | | | | | | |
| 32 | 18 | 24/15 | 32-34 | 1-1<br>2-3 | | Very loose, brown to yellowish-brown, well | | | |

**REMARKS**

1. Groundwater was encountered at approximately 20.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-8/MW-8

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
1758 House Street NE
Belmont, Michigan

**Boring No.:** SB-8/MW-8
**Page:** 3 **of** 3
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 33 | | | | | | sorted, fine to medium grained SAND, trace Silt, wet (SP). | SAND (SP) | | Bottom of Well Screen |
| 34 | 19 | 24/17 | 34-36 | 0-1<br>2-3 | | Very loose, brown to yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | Bottom of Borehole at 36.0 Feet | 36' | 2 | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |

**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from 27.7 to 32.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-8/MW-8

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 1 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Joe Workman/John Morehouse
**Date Start/Finish:** 11-10-17 / 11-17-17
**Boring Location:**
**GS Elev.:** 818.20' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

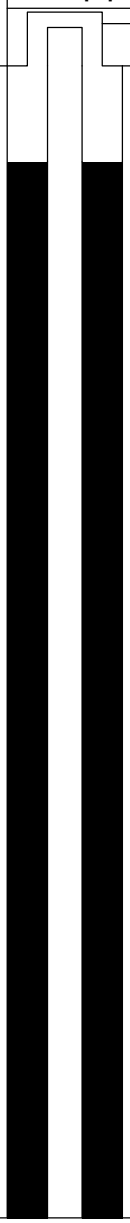
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/13 | 0-2 | 2-2<br>1-2 | 1.0 tsf | Stiff, brown, CLAY & SILT, trace fine to medium Sand, trace Organic Matter, damp (CL). | CLAY & SILT (CL) | 1 |
| 1 | | | | | | | | |
| 2 | 2 | 24/6 | 2-4 | 1-2<br>3-5 | 1.5 tsf | Stiff, brown, CLAY & SILT, trace fine to coarse Sand, trace fine Gravel, damp (CL). | | |
| 3 | | | | | | | | |
| 4 | 3 | 24/24 | 4-6 | 2-4<br>7-8 | 3.5 tsf | Very stiff, brown, CLAY & SILT, trace fine Sand, damp (CL). | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/24 | 6-8 | 4-5<br>9-11 | 3.0 tsf | Very stiff, brown, CLAY & SILT, trace fine Sand, damp (CL). | | |
| 7 | | | | | | | | |
| 8 | 5 | 24/24 | 8-10 | 2-4<br>7-9 | 2.5 tsf | Very stiff, brown, CLAY & SILT, trace fine Sand, damp (CL). Changing at 9.0 feet to: Very stiff, brown, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, damp (CL). | | |
| 9 | | | | | 3.5 tsf | | | |
| 10 | 6 | 24/24 | 10-12 | 4-5<br>13-12 | 1.0 tsf | Stiff, brown, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, damp (CL). Changing at 11.0 feet to: Very stiff, brown and gray, CLAY & SILT with intermittent 1/8 inch seams of fine to medium Sand, damp (CL). | | |
| 11 | | | | | 3.5 tsf | | | |

**Equipment Installed**




**REMARKS**

1. Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate consistency of coheisve soil.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

BORING_WELL 6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 2 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24/24 | 12-14 | 4-8<br>12-10 | 3.5 tsf<br>3.0 tsf | Very stiff, brown and gray, CLAY & SILT with intermittent 1/8 inch seams of fine to medium Sand, damp (CL). Changing at 13.2 feet to: Very stiff, gray, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, damp (CL). | CLAY & SILT (CL) | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/24 | 14-16 | 3-4<br>7-11 | 3.0 tsf | Very stiff, gray, CLAY & SILT, little fine to coarse Sand with intermittent 1/16" seams of fine to medium Sand, damp (CL). | | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/24 | 16-18 | 3-5<br>9-12 | 3.0 tsf | Very stiff, brown and gray CLAY & SILT, trace fine to medium Sand, damp (CL). Changing at 17.7 feet to: Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 17 | | | | | | | 17.7' SAND (SP) | | |
| 18 | 10 | 24/13 | 18-20 | 2-6<br>7-8 | | Medium dense, brown, fine to medium SAND, trace coarse Sand, trace Silt, damp (SP). | | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/8 | 20-22 | 6-13<br>12-11 | 3.0 tsf | Very stiff, brown, CLAY & SILT, little fine to coarse Sand, damp (CL). Changing at 21.0 feet to: Medium dense, brown, fine to coarse SAND, little fine to coarse Gravel, trace Silt, damp (SW). | 20' CLAY & SILT (CL) | | |
| 21 | | | | | | | 21' SAND (SP) | | |
| 22 | 12 | 24/20 | 22-24 | 5-5<br>7-8 | | Medium dense, brown, fine to medium SAND, trace coarse Sand, trace fine to coarse Gravel, trace Silt, damp (SP). | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/20 | 24-26 | 2-2<br>2-3 | | Medium dense, brown, fine to medium SAND, trace coarse Sand, trace fine to coarse Gravel, trace Silt, wet (SP). | | 2 | |
| 25 | | | | | | | | | |

**REMARKS**

2. Groundwater was encountered at approximately 24.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 3 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/13 | 26-28 | 1-1<br>3-2 | | Loose, brown, fine to medium SAND, trace coarse Sand, trace Silt, wet (SP). | SAND (SP) | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/14 | 28-30 | 1-1<br>2-3 | | Loose, brown, fine to medium SAND, trace coarse Sand, trace Silt, wet (SP). | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/24 | 30-32 | 3-1<br>3-4 | | Loose, brown, fine to medium SAND, trace coarse Sand, trace Silt, wet (SP). Changing at 31.0 feet to: Stiff, brown, CLAY & SILT, little fine to coarse Sand, moist (CL). | 31' CLAY & SILT (CL) | | |
| 31 | | | | | 1.0 tsf | | | | |
| 32 | 17 | 24/8 | 32-34 | 2-5<br>4-4 | 0.25 tsf | Very soft, brown, CLAY & SILT, some fine to coarse Sand, little fine Gravel, moist (CL). | | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/14 | 34-36 | 6-3<br>6-7 | 1.5 tsf | Stiff, brown, CLAY & SILT, some fine to coarse Sand, little fine Gravel, damp (CL). | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/15 | 36-38 | 6-8<br>12-14 | 2.5 tsf | Very stiff, brown, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, damp (CL). | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/14 | 38-40 | 8-16<br>12-12 | 3.5 tsf | Very stiff, gray, CLAY & SILT, some fine to coarse Sand, trace Cobbles (based on fragments), damp (CL). | | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 4 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/16 | 40-42 | 2-9<br>31-17 | >4.0 tsf | Hard, gray, CLAY & SILT, some fine to coarse Sand, trace fine to coarse Gravel, damp (CL). | CLAY & SILT (CL) | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/22 | 42-44 | 3-4<br>10-14 | 2.5 tsf | Very stiff, gray, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, damp (CL). | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/19 | 44-46 | 4-6<br>15-18 | 3.0 tsf | Very stiff, gray, CLAY & SILT, little fine to coarse Sand, trace fine to coarse Gravel, damp (CL). | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/20 | 46-48 | 3-15<br>32-28 | >4.0 tsf | Hard, gray, CLAY & SILT, little fine to coarse Sand, trace fine to coarse Gravel, damp (CL). | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/20 | 48-50 | 4-18<br>22-30 | >4.0 tsf | Hard, gray, CLAY & SILT, little fine to coarse Sand, damp (CL). | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/0 | 50-52 | 25-29<br>35-45 | | NO RECOVERY. | 50'<br>NO RECOVERY | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/20 | 52-54 | 26-24<br>30-31 | >4.0 tsf | Hard, gray, CLAY & SILT, some fine to coarse Sand, little fine to coarse Gravel, trace Cobbles (based on fragments), damp (CL). | 52'<br>CLAY & SILT (CL) | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

BORING_WELL 6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 5 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 28 | 24/24 | 54-56 | 10-17<br>20-30 | 4.0 tsf | Hard, gray, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, damp (CL). | CLAY & SILT (CL) | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/0 | 56-58 | 24-40<br>49-54 | | NO RECOVERY. | 56' NO RECOVERY | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24/24 | 58-60 | 8-18<br>20-31 | >4.0 tsf | Hard, gray, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, damp (CL). | 58' CLAY & SILT (CL) | | |
| 59 | | | | | | | | | |
| 60 | 31 | 24/24 | 60-62 | 5-4<br>18-24 | 4.0 tsf | Hard, gray, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, damp (CL). | | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/24 | 62-64 | 6-14<br>14-15 | | Brown, poorly sorted, SILT & CLAY, little Sand, trace gravel, plastic, cohesive, moist (ML). | 62' SILT & CLAY (ML) | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/24 | 64-66 | 6-12<br>15-17 | | Brown, poorly sorted, SILT & CLAY, little Sand, trace gravel, plastic, cohesive, moist (ML). | | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/24 | 66-68 | 5-9<br>14-25 | | Brown, poorly sorted, SILT & CLAY, little Sand, trace gravel, plastic, cohesive, moist (ML). | | | |
| 67 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 6 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 35 | 24/24 | 68-70 | 9-14<br>19-26 | | Brown, poorly sorted, SILT & CLAY, little Sand, trace gravel, plastic, cohesive, moist (ML). | SILT & CLAY (ML) | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/23 | 70-72 | 5-15<br>20-26 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | 70'<br>CLAY & SILT (CL) | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/24 | 72-74 | 7-14<br>23-28 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/24 | 74-76 | 9-11<br>15-20 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/14 | 76-78 | 10-13<br>33-39 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/24 | 78-80 | 5-25<br>19-23 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 79 | | | | | | | | | |
| 80 | 41 | 24/24 | 80-82 | 6-11<br>15-21 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 81 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 7 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 42 | 24/24 | 82-84 | 10-15 23-25 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | CLAY & SILT (CL) | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/12 | 84-86 | 7-14 21-20 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/24 | 86-88 | 8-18 23-25 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 87 | | | | | | | | | |
| 88 | 45 | 24/15 | 88-90 | 5-38 33-33 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 89 | | | | | | | | | |
| 90 | 46 | 24/24 | 90-92 | 8-14 15-28 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | |
| 91 | | | | | | | | | |
| 92 | 47 | 24/24 | 92-94 | 15-16 25-33 | | Brown grading to dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). Changing at 92.1 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist (CL). | 92.1' Silty CLAY (CL) | | |
| 93 | | | | | | | | | |
| 94 | 48 | 24/24 | 94-96 | 13-22 37-43 | | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist (CL). Changing at 94.4 feet to: Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | 94.4' CLAY & SILT (CL) | | |
| 95 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 8 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 49 | 24/24 | 96-98 | 8-18<br>30-23 | | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | CLAY & SILT (CL) | | |
| 97 | | | | | | | | | |
| 98 | 50 | 24/24 | 98-100 | 14-24<br>33-45 | | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). | | | Grout |
| 99 | | | | | | | | | |
| 100 | 51 | 24/21 | 100-102 | 19-29<br>47-50/3.5" | | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist (CL). Changing at 101.5 feet to: Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slighty plastic, moist with occasional very thin lenses of Clayey Silt, moist (ML). | | | |
| 101 | | | | | | | 101.5'<br>SILT (ML) | | |
| 102 | 52 | 24/24 | 102-104 | 13-26<br>38-44 | | Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slighty plastic, moist with occasional very thin lenses of Clayey Silt, moist (ML). | | | |
| 103 | | | | | | | | | |
| 104 | 53 | 24/24 | 104-106 | 20-30<br>41-39 | | Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slighty plastic, moist with occasional very thin lenses of Clayey Silt, moist (ML). | | | |
| 105 | | | | | | | | | |
| 106 | 54 | 24/24 | 106-108 | 22-33<br>37-50 | | Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slighty plastic, moist with occasional very thin lenses of Clayey Silt, moist (ML). | | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24/14 | 108-110 | 7-9<br>27-28 | | Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slighty plastic, moist with occasional very thin lenses of Clayey Silt, moist (ML). Changing at 108.8 feet to: Dark grayish-brown, well sorted, CLAY, plastic, cohesive, moist (CL). | 108.8'<br>CLAY (CL) | | |
| 109 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 9 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 56 | 24/14 | 110-112 | 20-41-50 | | Dark grayish-brown, well sorted, CLAY, plastic, cohesive, moist (CL). Changing at 110.3 feet to: Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slightly plastic, moist with occasional very thin lenses of Clayey Silt, moist (ML). | CLAY (CL) 110.3 SILT (ML) | | |
| 111 | | | | | | | | | |
| 112 | 57 | 24/15 | 112-114 | 9-30-50/5" | | Dark grayish-brown, well sorted, CLAY, plastic, cohesive, moist (CL). Changing at 112.8 feet to: Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slightly plastic, moist with occasional very thin lenses of Clayey Silt (ML). | 112' CLAY (CL) 112.8' SILT (ML) | | |
| 113 | | | | | | | | | |
| 114 | 58 | 24/24 | 114-116 | 15-20 36-50 | | Dark grayish-brown, well sorted, CLAY, plastic, coesive, moist (CL). Changing at 114.4 feet to: Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slightly plastic, moist with occasional very thin lenses of Clayey Silt, moist (ML). Changing at 114.6 feet to: Dark grayish-brown, well sorted, CLAY, plastic, cohesive, moist (CL). Changing at 115.2 feet to: Dark grayish-brown, well sorted, CLAY, plastic, cohesive, moist (CL). Dark grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slightly plastic, moist with occasional very thin lenses of Clayey Silt (ML). Changing at 116.3 feet to: Grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slightly plastic, moist with occasional very thin lenses of Clayey Silt (ML). Grayish-brown, very well sorted, SILT, trace Clay, cohesive, non to slightly plastic, moist with occasional very thin lenses of Clayey Silt (ML). | 114' CLAY (CL) 114.4' 114.6 SILT (ML) CLAY (CL) 115.1' 115.2 SILT (ML) CLAY (CL) | | |
| 115 | | | | | | | | | |
| 116 | 59 | 24/15 | 116-118 | 1-1 2-5 | | | 116' SILT (ML) | | |
| 117 | | | | | | | | | |
| 118 | 60 | 24/13 | 118-120 | 4-11 23-42 | | | | | |
| 119 | | | | | | | | | |
| 120 | 61 | 24/0 | 120-122 | 17-55 | | NO RECOVERY. | 120' NO RECOVERY | | |
| 121 | | | | | | | | | |
| 122 | 62 | 24/12 | 122-124 | 26-44-50/3" | | Very dense, grayish-brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Changing at 122.8 feet to: Very dense, grayish-brown to brown, very well sorted, fine grained SAND, some Silt, wet (SM). | 122' SAND (SP) 122.8' SAND (SM) 124' | 3 | |
| 123 | | | | | | | | | |

**REMARKS**

3. Groundwater was encountered at approximately 122.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 10 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 24/12 | 124-126 | 27-50/4" | | Very dense, grayish-brown to brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). Changing at 124.4 feet to: Dark gray, poorly sorted, SILT & CLAY, little Sand, trace Gravel, plastic, cohesive, moist (ML). Changing at 124.6 feet to: Very dense, grayish-brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). | SAND (SP) 124.4' SILT & CLAY (CL) 124.6' SAND (SP) | | |
| 125 | | | | | | | | | |
| 126 | 64 | 24/18 | 126-128 | 5-14-50/5" | | Very dense, grayish-brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Changing at 126.3 feet to: Dark grayish-brown, very well sorted, Silty CLAY, plastic, cohesive, bedded, moist (CL). Changing at 127.0 feet to: Very dense, brown to grayish-brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). | 126.3' Silty CLAY (CL) 127' SAND (SP) | | |
| 127 | | | | | | | | | |
| 128 | 65 | 24/14 | 128-130 | 8-46-50/2" | | Very dense, brown to grayish-brown, well sorted, fine to medium grained SAND, little Silt, wet (SM). | 128' SAND (SM) | | |
| 129 | | | | | | | | | |
| 130 | 66 | 24/6 | 130-132 | 36-50/4" | | Very dense, brown to grayish-brown, well sorted, fine to medium grained SAND, little Silt, wet (SM). | | | |
| 131 | | | | | | | | | |
| 132 | 67 | 24/9 | 132-134 | 26-50/4.5" | | Very dense, brown to grayish-brown, well sorted, fine to medium grained SAND, little Silt, wet (SM). Changing at 132.3 feet to: Very dense, brown to dark brown, moderately sorted, coarse to fine grained SAND, trace Silt, wet (SW). Changing at 132.5 feet to: Very dense, brown to grayish-brown, well sorted, fine to medium SAND, little Silt, wet (SM). | 132.3' SAND (SW) 132.5' SAND (SP) | | |
| 133 | | | | | | | | | |
| 134 | 68 | 24/3 | 134-136 | 5-10 39-50/4" | | Dense, brown to grayish-brown, well sorted, fine to medium SAND, little Silt, wet (SM). | | | |
| 135 | | | | | | | | | |
| 136 | 69 | 24/6 | 136-138 | 9-32-50/5" | | Very dense, brown to grayish-brown, well sorted, fine to medium SAND, little Silt, wet (SM). | | | |
| 137 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 11 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 70 | 24/4 | 138-140 | 50/5" | | Very dense, grayish-brown, moderately sorted, fine to medium grained SAND, little Silt, trace Clay, trace Gravel, slightly cohesive, wet (SM). | SAND (SP) | | |
| 139 | | | | | | | | | |
| 140 | 71 | 24/6 | 140-142 | 50/5.5" | | Very dense, grayish-brown, well sorted, fine grained SAND, trace Silt, non to slightly cohesive, wet with occasional very thin seams of Silty Clay (SP-SC). | | | |
| 141 | | | | | | | | | |
| 142 | 72 | 24/4 | 142-144 | 50/4.5" | | Very dense, brown to dark brown, moderately sorted, fine to coarse grained SAND, trace Silt, trace Clay, trace Gravel, wet (SW). | 142' SAND (SW) | | |
| 143 | | | | | | | | | |
| 144 | 73 | 24/8 | 144-146 | 12-37-50/2" | | Very dense, dark grayish-brown, poorly sorted, fine to coarse grained SAND, trace Gravel, trace Silt, trace Clay, wet (SW). Changing at 144.4 feet to: Very dense, pale brown grading to brown, moderately sorted, fine to coarse grained SAND, trace Silt, trace Gravel, non to slightly cohesive, wet (SW). | | | |
| 145 | | | | | | | | | |
| 146 | 74 | 24/10 | 146-148 | 32-50/3.5" | | Very dense, pale brown grading to brown, moderately sorted, fine to coarse grained SAND, trace Silt, trace Gravel, non to slightly cohesive, wet (SW). | | | |
| 147 | | | | | | | | | |
| 148 | 75 | 24/9 | 148-150 | 35-50/3" | | Very dense, pale brown grading to brown, moderately sorted, fine to coarse grained SAND, trace Silt, trace Gravel, non to slightly cohesive, wet (SP). Changing at 148.6 feet to: Very dense, pale brown, very well sorted, fine to medium SAND, trace Silt, wet (SP). | 148.6' SAND (SP) | | |
| 149 | | | | | | | | | |
| 150 | 76 | 24/4 | 150-152 | 50/5" | | Very dense, pale brown, moderately sorted, fine to coase grained SAND, trace Silt, trace Gravel, wet (SW). | 150' SAND (SW) | | |
| 151 | | | | | | | | | |
| | | | | | | | 152' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 12 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 77 | 24/0 | 152-154 | 50/4" | | NO RECOVERY. | NO RECOVERY | | |
| 153 | | | | | | | | | |
| 154 | 78 | 24/4 | 154-156 | 50/5.5" | | Very dense, pale brown, moderately sorted, fine to coarse SAND, trace Silt, trace Gravel, wet (SW). | 154' SAND (SW) | | |
| 155 | | | | | | | | | |
| 156 | 79 | 24/7 | 156-158 | 34-50/4" | | Very dense, pale brown, moderately sorted, fine to coarse grained SAND, trace Silt, trace Gravel, wet (SW). Changing at 156.5 feet to: Pale brown, very well sorted, SILT, trace Clay, moderately cohesive, slightly plastic, wet (ML). | 156.5' SILT (ML) | | |
| 157 | | | | | | | | | |
| 158 | 80 | 24/4 | 158-160 | 40-50/2.5" | | Very dense, grayish-brown, very well sorted, fine grained SAND, little Silt, wet (SM). | 158' SAND (SM) | | |
| 159 | | | | | | | | | |
| 160 | 81 | 24/3 | 160-162 | 50/5" | | Very dense, grayish-brown, very well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 161 | | | | | | | | | |
| 162 | 82 | 24/4 | 162-164 | 41-50/5" | | Very dense, brown to dark brown, moderately well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 163 | | | | | | | | | |
| 164 | 83 | 24/4 | 164-166 | 50/6" | | Very dense, brown to dark brown, moderately well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 165 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 13 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 84 | 24/3 | 166-168 | 43-50/3" | | Very dense, brown to dark brown, moderately well sorted, fine grained SAND, little Silt, wet (SM). | SAND (SM) | | |
| 167 | | | | | | | | | |
| 168 | 85 | 24/2 | 168-170 | 47-50/3" | | Very dense, brown, well sorted, fine to medium SAND, little Silt, trace Clay, slightly cohesive, non to slightly plastic, wet (SM). | | | |
| 169 | | | | | | | | | |
| 170 | 86 | 24/7 | 170-172 | 36-50/4" | | Very dense, brown, well sorted, fine to medium SAND, little Silt, trace Clay, slightly cohesive, non to slightly plastic, wet (SM). | | | |
| 171 | | | | | | | | | |
| 172 | 88 | 24/0 | 172-174 | 43-50/3" | | Very dense, brown, well sorted, fine to medium SAND, little Silt, trace Clay, slightly cohesive, non to slightly plastic, wet (SM). | | | |
| 173 | | | | | | | | | |
| 174 | 89 | 24/10 | 174-176 | 35-50 | | Very dense, brown, well sorted, fine to medium SAND, little Silt, trace Clay, slightly cohesive, non to slightly plastic, wet (SM). Changing at 174.2 feet to: Grayish-brown, very well sorted, SILT, little fine grained Sand, trace Clay, slightly cohesive, slightly plastic, moist to wet (ML). | 174.2' SILT (ML) | | |
| 175 | | | | | | | | | |
| 176 | 90 | 24/0 | 176-178 | 28-50 | | NO RECOVERY. | 176' NO RECOVERY | | |
| 177 | | | | | | | | | |
| 178 | 91 | 24/4 | 178-180 | 45-50/3.5" | | Grayish-brown, very well sorted, SILT, little fine grained Sand, trace Clay, slightly cohesive, slightly plastaic, moist to wet (ML). | 178' SILT (ML) | | |
| 179 | | | | | | | | | |
| | | | | | | | 180' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 14 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 92 | 24/1 | 180-182 | 45-50/3.5" | | Very dense, brown, well sorted, fine to medium SAND, little Silt, trace Clay, slightly cohesive, non to slightly plastic, wet (SM). | SAND (ML) | | |
| 181 | | | | | | | | | |
| 182 | 93 | 24/6 | 182-184 | 50 | | Very dense, brown to dark brown, moderately well sorted, fine grained SAND, little Silt, wet (SM). Changing at 182.1 feet to: Brown to dark brown, very well sorted, SILT, moderately cohesive, wet (ML). Changing at 182.2 feet to: Brown to dark brown, moderately well sorted, fine grained SAND, little Silt, wet (SM). Changing at 182.4 feet to: Brown to dark brown, very well sorted, SILT, moderately cohesive, wet (ML). | 182.1' SILT (ML) 182.2' SAND (SM) 182.4' SILT (ML) | | |
| 183 | | | | | | | | | |
| 184 | 94 | 24/0 | 184-186 | 50/5.5" | | NO RECOVERY. | 184' NO RECOVERY | | |
| 185 | | | | | | | | | |
| 186 | 95 | 24/6 | 186-188 | 58/6" | | Very dense, grayish-brown, very well sorted, fine to medium SAND, trace Silt, trace Clay, slightly cohesive, wet (SP). | 186' SAND (SP) | | |
| 187 | | | | | | | | | |
| 188 | 96 | 24/5 | 188-190 | 75/6" | | Very dense, grayish-brown, very well sorted, fine to medium SAND, trace Silt, trace Clay, slightly cohesive, wet (SP). | | | |
| 189 | | | | | | | | | |
| 190 | 97 | 24/4 | 190-192 | 50/6" | | Very dense, grayish-brown, very well sorted, fine to medium SAND, trace Silt, trace Clay, slightly cohesive, wet (SP). | | | |
| 191 | | | | | | | | | |
| 192 | 98 | 24/2 | 192-194 | 50/5" | | Very dense, grayish-brown, very well sorted, fine to medium SAND, trace Silt, trace Clay, slightly cohesive, wet (SP). | | | |
| 193 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

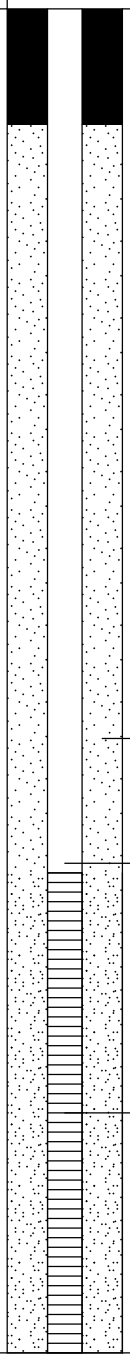
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 15 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 99 | 24/9 | 194-196 | 42-50/3" | | Grayish-brown, very well sorted, fine to medium SAND, trace Silt, trace Clay, slightly cohesive, wet (SP). Changing at 194.3 feet to: Grayish-brown, very well sorted, SILT, cohesive, moist to wet (ML). | 194.3' SAND (SP) / SILT (ML) | |
| 195 | | | | | | | | |
| 196 | 100 | 24/9 | 196-198 | 15-38-50/3" | | Grayish-brown, very well sorted, SILT, cohesive, moist to wet (ML). | | |
| 197 | | | | | | | | |
| 198 | 101 | 24/9 | 198-200 | 24-50/5" | | Grayish-brown, poorly sorted, CLAY & SILT, some Sand, trace Gravel, slightly plastic, moderately cohesive, moist (CL). Changing at 198.2 feet to: Grayish-brown, very well sorted, SILT, cohesive, moist to wet (ML). | 198' / 198.2' CLAY & SILT (CL) / SILT (ML) | |
| 199 | | | | | | | | |
| 200 | 102 | 24/4 | 200-202 | 28-50/3" | | Grayish-brown, poorly sorted, CLAY & SILT, some Sand, trace Gravel, slightly plastic, moderately cohesive, moist (CL). | 200' CLAY & SILT (CL) | |
| 201 | | | | | | | | |
| 202 | 103 | 24/3 | 202-204 | 50/6" | | Grayish-brown, poorly sorted, CLAY & SILT, some Sand, trace Gravel, slightly plastic, moderately cohesive, moist (CL). | | |
| 203 | | | | | | | | |
| 204 | 104 | 24/7 | 204-206 | 50/6" | | Grayish-brown, poorly sorted, CLAY & SILT, some Sand, trace Gravel, slightly plastic, moderately cohesive, moist (CL). Changing at 204.3 feet to: Grayish-brown, well sorted, fine to medium grained SAND, litle Silt, moderately cohesive, wet (SM). Changing at 204.4 feet to: Grayish-brown, moderately well sorted, fine to medium SAND, little Silt, trace Gravel, non-plastic, non-cohesive, moist to wet (SM). | 204.3' SAND (SM) | |
| 205 | | | | | | | | |
| 206 | 105 | 24/12 | 206-208 | 30-50/4" | | Grayish-brown, moderately well sorted, fine to medium SAND, little Silt, trace Gravel, non-plastic, non-cohesive, moist to wet (SM). Changing at 206.4 feet to: Grayish-brown, well sorted, SILT, trace Clay, slightly coheisive, moderately | 206.4' / 206.5' SILT (ML) / SAND (SM) | |
| 207 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

BORING_WELL 6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-9/MW-9D
**Page:** 16 **of** 16
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 106 | 24/9 | 208-210 | 19-24 23-25 | | cohesive, moist to wet (ML). Changing at 206.5 feet to: Dense, grayish-brown, moderately well sorted, fine to medium SAND, little Silt, trace Gravel, non-plastic, non-cohesive, moist to wet (SM). | SAND (SM) 208.4' | | Bottom of Well Screen |
| 209 | | | | | | Dense, grayish-brown, moderately well sorted, fine to medium SAND, little Silt, trace Gravel, non-plastic, non-cohesive, moist to wet (SP). Changing at 208.4 feet to: Grayish-brown, well sorted, SILT, trace Clay, slightly cohesive, moderately cohesive, moist to wet (ML). Changing at 208.8 feet to: Grayish-brown, very well sorted, Silty CLAY, plastic, cohesive, moist (CL). | SILT (ML) 208.8' Silty CLAY (CL) | | |
| 210 | 107 | 24/8 | 210-212 | 14-18-75/6" | | | | | |
| 211 | | | | | | | 211.3' SAND (SM) | | |
| 212 | 108 | 24/15 | 212-214 | 19-45-50/3" | | Grayish-brown, very well sorted, Silty CLAY, plastic, cohesive, moist (CL). Changing at 211.3 feet to: Grayish-brown, moderately well sorted, fine to medium SAND, little Silt, trace Gravel, non-plastic, non-cohesive, moist to wet (SM). | 212' Silty CLAY (CL) | | |
| 213 | | | | | | Grayish-brown, very well sorted, Silty CLAY, plastic, cohesive, moist (CL). Changing at 212.9 feet to: Grayish-brown, well sorted, fine to medium SAND, little Silt, trace Clay, wet with occasional very thin Silty Clay seams (SM). | 212.9' SAND (SM) | | |
| 214 | 109 | 24/12 | 214-216 | 34-50/3" | | Grayish-brown, well sorted, fine to medium SAND, little Silt, trace Clay, wet with occasional very thin Silty Clay seams (SM). Changing at 214.7 feet to: Grayish-brown, moderately well sorted, fine to medium SAND, little Silt, trace Gravel, non-plastic, non-cohesive, moist to wet (SM). Changing at 214.9 feet to: Grayish-brown, well sorted, SILT, trace Clay, slightly to moderately coheisve, moist to wet (ML). | 214.9' SILT (ML) | | |
| 215 | | | | | | | | | |
| 216 | 110 | 24/18 | 216-218 | 18-27-50/5" | | | 216' Silty CLAY (CL) | | |
| 217 | | | | | | Grayish-brown, very well sorted, Silty CLAY, plastic, cohesive, moist (CL). Changing at 217.4 feet to: Dark gray with reddish-yellow stains, poorly sorted, CLAY & SILT, some Sand, trace Gravel, wet (CL). | 217.4' CLAY & SILT (CL) | | |
| 218 | 111 | 24/18 | 218-220 | 15-32-50/4" | | Grayish-brown, very well sorted, Silty CLAY, plastic, cohesive, moist (CL). | 218' Silty CLAY (CL) | | |
| 219 | | | | | | | | | |
| 220 | | | | | | Bottom of Borehole at 220.0 Feet | 220' | 4 | |
| 221 | | | | | | | | | |

**REMARKS**

4. Monitoring well was installed in borehole upon completion. Well screen set from 203.0 to 208.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-9/MW-9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-9M
**Page:** 1 **of** 4
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-17-17 / 11-17-17
**Boring Location:**
**GS Elev.:** 817.90' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

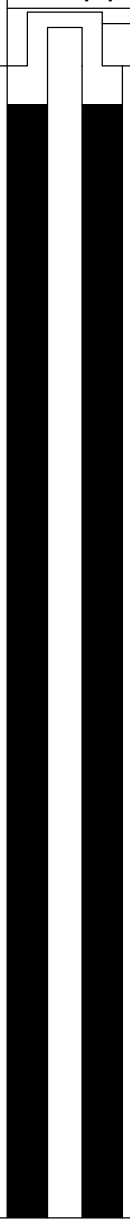
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See SB-9/MW-9D boring log for sample description and classification. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-9M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-9M
**Page:** 2 **of** 4
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | Grout |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-9M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-9M
**Page:** 3 **of** 4
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information | | | | | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-9M

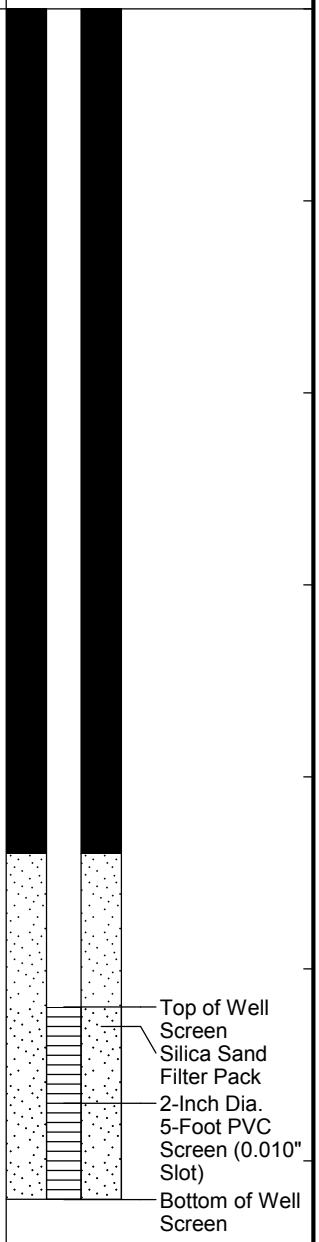
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-9M
**Page:** 4 **of** 4
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 101 | | | | | | | | |
| 102 | | | | | | | | |
| 103 | | | | | | | | |
| 104 | | | | | | | | |
| 105 | | | | | | | | |
| 106 | | | | | | | | |
| 107 | | | | | | | | |
| 108 | | | | | | | | |
| 109 | | | | | | | | |
| 110 | | | | | | | | |
| 111 | | | | | | | | |
| 112 | | | | | | | | |
| 113 | | | | | | | | |
| 114 | | | | | | | | |
| 115 | | | | | | | | |
| 116 | | | | | | | | |
| 117 | | | | | | | | |
| 118 | | | | | | | | |
| 119 | | | | | | | | |
| 120 | | | | | | | | |
| 121 | | | | | | | | |
| 122 | | | | | | | | |
| 123 | | | | | | | | |
| 124 | | | | | | | | |
| 125 | | | | | | | | |
| 126 | | | | | | | | |
| 127 | | | | | | | | |
| 128 | | | | | | | | |
| 129 | | | | | | | | |
| 130 | | | | | | | | |
| 131 | | | | | | Bottom of Borehole at 131.0 Feet | | 1 |
| 132 | | | | | | | | |
| 133 | | | | | | | | |
| 134 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 126.0 to 131.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-9M

BORING_WELL 6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-9S
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-17-17 / 11-17-17
**Boring Location:**
**GS Elev.:** 817.80' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

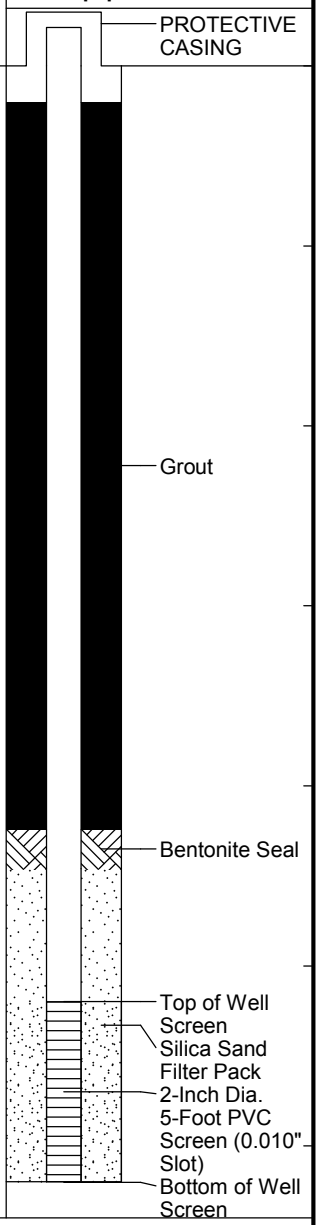
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–31 | | | | | | See SB-9/MW-9D boring log for sample description and classification. | | |
| 31 | | | | | | Bottom of Borehole at 31.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 26.0 to 31.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-9S

BORING_WELL 6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 1 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Julie Groenleer/Joe Workman
**Date Start/Finish:** 11-20-17 / 11-28-17
**Boring Location:** 587,298.7726 N; 12,789,357.1821 E
**GS Elev.:** 780.9' **Datum:**

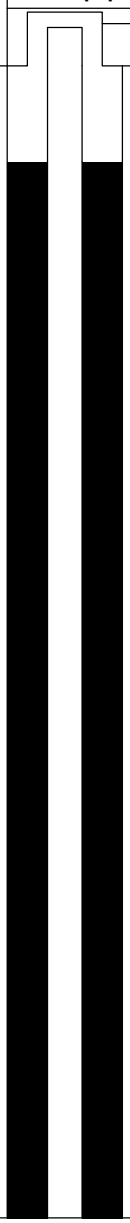
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/17 | 0-2 | 2-2 3-2 | | TOPSOIL. Changing at 0.6 feet to: Loose, brown, fine to medium SAND, trace Silt, damp (SP). | TOPSOIL 0.6' SAND (SP) | |
| 2 | 2 | 24/16 | 2-4 | 2-3 8-7 | | Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | | |
| 4 | 3 | 24/0 | 4-6 | 4-5 6-8 | | NO RECOVERY. | 4' NO RECOVERY | |
| 6 | 4 | 24/18 | 6-8 | 3-3 4-4 | | Loose, brown, fine to medium SAND, trace Silt, damp (SP). | 6' SAND (SW) | |
| 8 | 5 | 24/14 | 8-10 | 2-4 4-4 | | Loose, brown, fine to medium SAND, trace Silt, damp (SP). | | |
| 10 | 6 | 24/20 | 10-12 | 2-5 7-5 | | Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | | |
| 12 | 7 | 24/12 | 12-14 | 3-2 3-3 | | Loose, brown, fine to medium SAND, trace Silt, damp (SP). | | |
| 14 | 8 | 24/21 | 14-16 | 3-3 3-4 | | Loose, brown, fine to medium SAND, trace Silt, damp (SP). | | |
| 16 | 9 | 24/20 | 16-18 | 2-4 4-6 | | Loose, brown, fine to medium SAND, trace Silt, damp (SP). | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-10/MW-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 2 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 10 | 24/18 | 18-20 | 3-6<br>6-6 | | Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | SAND (SW) | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/17 | 20-22 | 3-4<br>6-7 | | Loose, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/19 | 22-24 | 3-5<br>6-7 | | Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/22 | 24-26 | 4-6<br>8-8 | | Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/18 | 26-28 | 6-13<br>13-18 | | Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/20 | 28-30 | 10-13<br>21-20 | | Dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/20 | 30-32 | 10-16<br>21-24 | | Dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/22 | 32-34 | 11-16<br>24-27 | | Dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/18 | 34-36 | 10-16<br>26-32 | | Dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/19 | 36-38 | 12-21<br>25-29 | | Dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/16 | 38-40 | 8-18<br>21-27 | | Dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI 62355.52 HOUSE STREET COMPLETE.GPJ WI_DNR.GDT 4/18/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 3 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND (SW) | | |
| 40 | 21 | 24/23 | 40-42 | 14-20 22-25 | | Dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/20 | 42-44 | 8-12 17-21 | | Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/24 | 44-46 | 7-10 10-9 | | Medium dense, brown, fine to medium SAND, trace Silt, damp (SP). | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/18 | 46-48 | 7-13 14-14 | | Medium dense, brown, fine to medium SAND, trace Silt, trace Gravel, damp (SP). | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/24 | 48-50 | 9-11 11-12 | | Medium dense, brown, fine to medium SAND, trace Silt, trace Gravel, damp (SP). | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/16 | 50-52 | 9-11 13-10 | | Medium dense, brown, fine to medium SAND, trace Silt, moist (SP). | | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/24 | 52-54 | 9-11 11-7 | | Medium dense, brown, fine to medium SAND, trace Silt, moist (SP). Changing at 53.0 feet to: Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | 1 | |
| 53 | | | | | | | | | |
| 54 | 28 | 24/17 | 54-56 | 3-3 6-8 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/18 | 56-58 | 2-3 7-7 | | Loose, brown, fine to coarse SAND, trace Silt, trace fine Gravel, wet (SW). | | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24/13 | 58-60 | 4-8 8-10 | | Medium dense, brown, fine to coarse SAND, trace Silt, trace fine Gravel, wet (SW). | | | |
| 59 | | | | | | | | | |

**REMARKS**

1. Groundwater was encountered at approximately 53.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-10/MW-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 4 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 31 | 24/6 | 60-62 | 2-4 6-9 | | Loose, brown, fine to coarse SAND, trace Silt, trace fine Gravel, wet (SW). | SAND (SW) | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/3 | 62-64 | 6-8 13-20 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 62' SAND (SP) | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/12 | 64-66 | 4-9 10-15 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/12 | 66-68 | 2-5 8-11 | | Medium dense, brown, fine to medium SAND, little Silt, wet (SM). | 66' SAND (SM) | | |
| 67 | | | | | | | | | |
| 68 | 35 | 24/8 | 68-70 | 5-7 13-15 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 68' SAND (SP) | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/11 | 70-72 | 3-3 7-8 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/13 | 72-74 | 2-4 10-10 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/20 | 74-76 | 2-3 5-12 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/17 | 76-78 | 3-8 10-13 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/12 | 78-80 | 4-5 8-15 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 79 | | | | | | | | | |
| 80 | 41 | 24/21 | 80-82 | 4-12 19-22 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-10/MW-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 5 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND (SP) | | |
| 82 | 42 | 24/13 | 82-84 | 4-12<br>21-25 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/22 | 84-86 | 6-10<br>15-15 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/18 | 86-88 | 3-7<br>7-15 | | Medium dense, brown, fine to medium SAND, trace Silt, trace coarse Sand, wet (SP). | | | |
| 87 | | | | | | | | | |
| 88 | 45 | 24/19 | 88-90 | 5-11<br>15-16 | | Medium dense, brown, fine to medium SAND, trace Silt, trace coarse Sand, wet (SP). | | | |
| 89 | | | | | | | | | |
| 90 | 46 | 24/16 | 90-92 | 4-8<br>20-22 | | Medium dense, brown, fine to medium SAND, trace Silt, trace coarse Sand, wet (SP). | | | |
| 91 | | | | | | | | | Grout |
| 92 | 47 | 24/20 | 92-94 | 4-7<br>15-19 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 93 | | | | | | | | | |
| 94 | 48 | 20/20 | 94-95.7 | 4-12<br>38-50/4" | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 95 | | | | | | | | | |
| 96 | 49 | 24/22 | 96-98 | 7-14<br>22-30 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 97 | | | | | | | | | |
| 98 | 50 | 24/4 | 98-100 | 5-8<br>15-22 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 99 | | | | | | | | | |
| 100 | 51 | 24/18 | 100-102 | 3-8<br>13-21 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 101 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-10/MW-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 6 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 52 | 24/20 | 102-104 | 4-5<br>15-19 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | SAND (SP) | | |
| 103 | | | | | | | | | |
| 104 | 53 | 24/18 | 104-106 | 6-7<br>13-21 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 105 | | | | | | | | | |
| 106 | 54 | 24/13 | 106-108 | 5-13<br>29-45 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24/17 | 108-110 | 5-11<br>21-35 | | Dense, brown, fine to medium SAND, little Silt, wet (SM). | 108'<br>SAND (SM) | | |
| 109 | | | | | | | | | |
| 110 | 56 | 24/20 | 110-112 | 4-13<br>32-56 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | 110'<br>SAND (SP) | | |
| 111 | | | | | | | | | |
| 112 | 57 | 24/7 | 112-114 | 5-11<br>18-31 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 113 | | | | | | | | | |
| 114 | 58 | 24/18 | 114-116 | 3-7<br>18-35 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 115 | | | | | | | | | |
| 116 | 59 | 24/8 | 116-118 | 2-2<br>3-5 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 117 | | | | | | | | | |
| 118 | 60 | 24/17 | 118-120 | 2-8<br>36-50 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 119 | | | | | | | | | |
| 120 | 61 | 17/8 | 120-121.4 | 4-37-50/5" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 121 | | | | | | | | | |
| 122 | 62 | 22/20 | 122-123.8 | 11-26<br>34-50/4" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI 62355.52 HOUSE STREET COMPLETE.GPJ WI_DNR.GDT 4/18/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 7 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND (SP) | | |
| 124 | 63 | 24/11 | 124-126 | 1-1<br>15-25 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 125 | | | | | | | | | |
| 126 | 64 | 24/0 | 126-128 | 2-3<br>8-21 | | NO RECOVERY. | 126'<br>NO RECOVERY | | |
| 127 | | | | | | | | | |
| 128 | 65 | 24/21 | 128-130 | 6-6<br>16-23 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 128'<br>SAND (SP) | | |
| 129 | | | | | | | | | |
| 130 | 66 | 24/13 | 130-132 | 1-10<br>12-15 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 131 | | | | | | | | | |
| 132 | 67 | 24/4 | 132-134 | 8-9<br>23-50 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 133 | | | | | | | | | |
| 134 | 68 | 20/12 | 134-135.7 | 5-12<br>26-50/4" | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 135 | | | | | | | | | |
| 136 | 69 | 20/13 | 136-137.7 | 3-7<br>31-50/2" | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 137 | | | | | | | | | |
| 138 | 70 | 16/11 | 138-139.3 | 2-21-50/4" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 139 | | | | | | | | | |
| 140 | 71 | 15/15 | 140-141.3 | 4-25-50/3" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 141 | | | | | | | | | |
| 142 | 72 | 12/12 | 142-143 | 19-50/6" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 143 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-10/MW-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 8 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 73 | 24/21 | 144-146 | 9-13 28-27 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | SAND (SP) | | |
| 145 | | | | | | | | | |
| 146 | 74 | 18/16 | 146-147.5 | 11-29-50/6" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 147 | | | | | | | | | |
| 148 | 75 | 24/20 | 148-150 | 6-13 32-50 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). Changing at 149.7 feet to: Dense, brown, fine SAND, little Silt, wet (SM). | | | |
| 149 | | | | | | | 149.7' SAND (SM) | | |
| 150 | 76 | 15/13 | 150-151.3 | 6-21-50/3" | | Dense, brown, fine SAND, little Silt, wet (SM). Changing at 150.6 feet to: Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | 150.6' SAND (SP) | | |
| 151 | | | | | | | | | |
| 152 | 77 | 11/11 | 152-152.9 | 11-50/5" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 153 | | | | | | | | | |
| 154 | 78 | 14/13 | 154-155.2 | 8-41-50/2" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 155 | | | | | | | | | |
| 156 | 79 | 24/17 | 156-158 | 8-15 27-50 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 157 | | | | | | | | | |
| 158 | 80 | 12/12 | 158-159 | 6-14 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 159 | | | | | | | | | |
| 160 | 81 | 24/11 | 160-162 | 3-5 10-16 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 161 | | | | | | | | | |
| 162 | 82 | 16/11 | 162-163.3 | 7-43-50/4" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 163 | | | | | | | | | |
| 164 | 83 | 16/16 | 164-165.3 | 2-50-50/4" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-10/MW-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 9 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND (SP) | | |
| 166 | 84 | 23/15 | 166-167.9 | 10-28 34-50/5" | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 167 | | | | | | | | | |
| 168 | 85 | 24/24 | 168-170 | 7-17 23-20 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 169 | | | | | | | | | |
| 170 | 86 | 23/23 | 170-171.9 | 6-12 19-50/5" | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). Changing at 171.0 feet to: Very dense, gray, fine to medium SAND, little Clay & Silt, trace coarse Sand, trace fine Gravel, wet (SC). | | | |
| 171 | | | | | | | 171' SAND (SC) | | |
| 172 | 87 | 24/24 | 172-174 | 16-28 48-36 | | Very dense, gray, fine to medium SAND, trace Silt, wet (SP). Changing at 173.0 feet to: Very dense, gray, fine to coarse SAND, little Clay & Silt, little fine Gravel, wet (SC). Changing at 173.5 feet to: Very dense, gray, fine to medium SAND, trace Silt, wet (SP). Changing at 173.9 feet to: Very dense, gray, fine to coarse SAND, little Clay & Silt, little fine Gravel, moist (SC). | 172' SAND (SP) | | |
| 173 | | | | | | | 173' SAND (SC) 173.5' SAND (SP) 173.9' SAND (SC) | | |
| 174 | 88 | 7/7 | 174-174.6 | 50-50/1" | | | 174' SAND (SP) | | |
| 175 | | | | | | | | | |
| 176 | 89 | 24/24 | 176-178 | 12-29 31-35 | | Very dense, gray, fine to medium SAND, trace coarse Sand, trace Clay & Silt, wet (SP). Very dense, gray, fine to coarse SAND, some fine to coarse Gravel, trace Clay & Silt, wet (SW). | 176' SAND (SW) | | |
| 177 | | | | | | | | | |
| 178 | 90 | 24/24 | 178-180 | 16-20 17-42 | | Very dense, gray, fine to coarse SAND, little fine Gravel, trace Clay & Silt, wet (SW). | | | |
| 179 | | | | | | | | | |
| 180 | 91 | 17/17 | 180-181.4 | 3-16-50/5" | | Medium dense, gray, fine to coarse SAND, little fine Gravel, trace Silt, wet (SW). Changing at 181.5 feet to: Very dense, gray, fine to medium SAND, little Silt, wet (SM). | | | |
| 181 | | | | | | | 181.5' SAND (SM) | | |
| 182 | 92 | 10/10 | 182-182.8 | 11-50/4" | | Very dense, fine to coarse SAND, little fine to coarse Gravel, trace Silt, wet (SW). | 182' SAND (SW) | | Bentonite Seal |
| 183 | | | | | | | | | |
| 184 | 93 | 4/4 | 184-184.3 | 75/4" | | Very dense, gray, fine to medium SAND, little Clay & Silt, trace coarse Sand, trace fine fine Gravel, moist (SC). | 184' SAND (SC) | | |
| 185 | | | | | | | | | Top of Well Screen |
| | | | | | | | 186' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

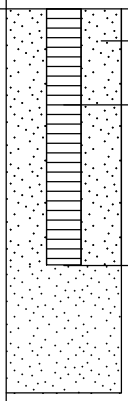
**Boring No.:** SB-10/MW-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-10/MW-10D
**Page:** 10 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 94 | 3/3 | 186-186.3 | 50/3" | | Very dense, gray, fine to coarse SAND, some fine to coarse Gravel, trace Cobble, trace Silt, wet (SW). | SAND (SW) | | Silica Sand Filter Pack |
| 187 | | | | | | | | | |
| 188 | 95 | 2/2 | 188-188.2 | 50/2" | | Very dense, gray, fine to coarse SAND, some fine to coarse Gravel, trace Cobble, trace Silt, wet (SW). | | | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 189 | | | | | | | | | |
| 190 | 96 | 3/1 | 190-190.3 | 50/3" | | NO RECOVERY. | 190' NO RECOVERY (Rock Fragment in Tip) | | Bottom of Well Screen |
| 191 | | | | | | | | | |
| 192 | | | | | | Bottom of Borehole at 192.0 Feet | 192' | 2 | |
| 193 | | | | | | | | | |
| 194 | | | | | | | | | |
| 195 | | | | | | | | | |
| 196 | | | | | | | | | |
| 197 | | | | | | | | | |
| 198 | | | | | | | | | |
| 199 | | | | | | | | | |
| 200 | | | | | | | | | |
| 201 | | | | | | | | | |
| 202 | | | | | | | | | |
| 203 | | | | | | | | | |
| 204 | | | | | | | | | |
| 205 | | | | | | | | | |
| 206 | | | | | | | | | |



**REMARKS**

2. Monitoring well installed upon completion.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-10/MW-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-10M
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Joe Workman
**Date Start/Finish:**
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

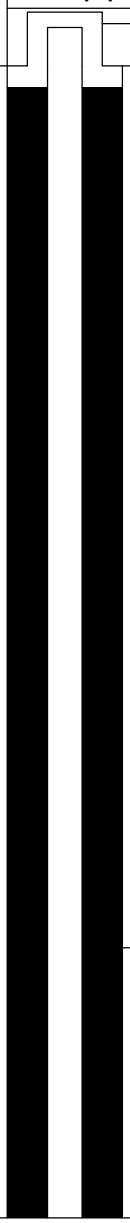
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See SB-10/MW-10D boring log for sample description and classification. | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

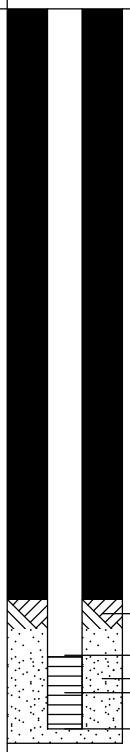
**Boring No.:** MW-10M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-10M
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 81–172 | | | | | | | | | |
| 131 | | | | | | Bottom of Borehole at 131.0 Feet | | 1 | |




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 125.0 to 130.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-10M

BORING_WELL 6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-10S
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Joe Workman
**Date Start/Finish:**
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

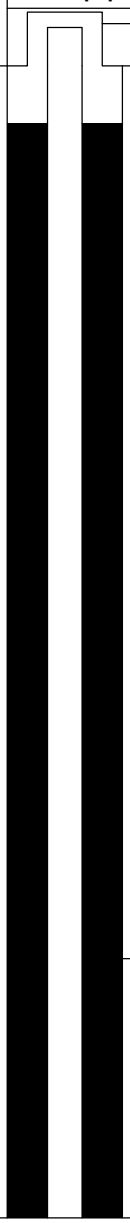
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See SB-10/MW-10D boring log for sample description and classification. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-10S

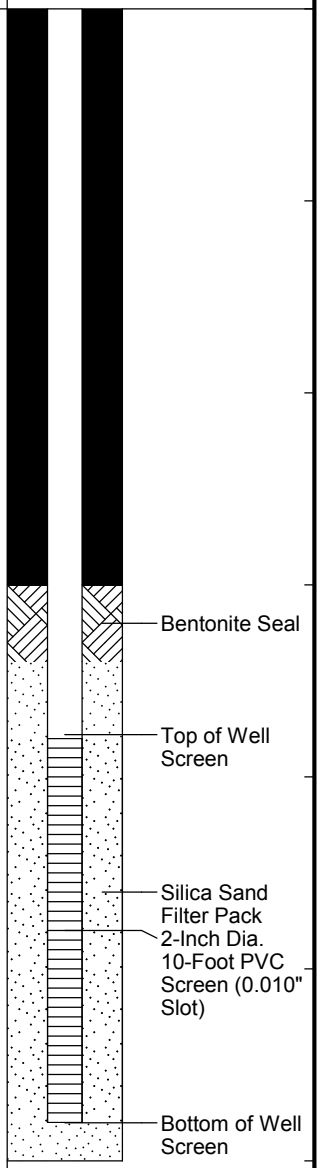
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-10S
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | Bottom of Borehole at 60.0 Feet | | 1 |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 49.0 to 59.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-10S

BORING_WELL 6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-11/MW-11D
**Page:** 1 **of** 5
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Julie Groenleer
**Date Start/Finish:** 11-6-17 / 11-8-17
**Boring Location:**
**GS Elev.:** 742.10' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

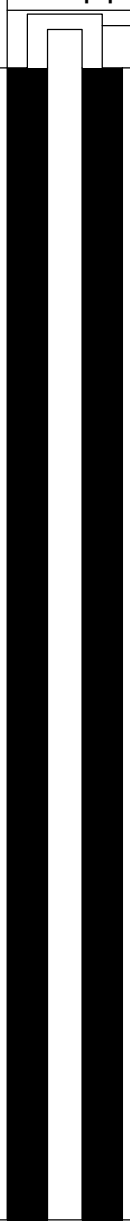
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/22 | 0-2 | 0-1<br>1-1 | 1.5 tsf | TOPSOIL. Changing at 0.2 feet to: Very loose, brown, fine to medium SAND, little Silt, damp (SM). Changing at 0.8 feet to: Stiff, brown, CLAY & SILT, trace fine Sand, moist (CL). Changing at 1.4 feet to: Very loose, dark brown, fine to medium SAND, little Clay, little Silt, damp (SC). Medium dense, brown, fine to medium SAND, little Silt, moist (SM). | 0.2' TOPSOIL<br>0.8' SAND (SM)<br>1.4' CLAY & SILT (CL)<br>2' SAND (SC)<br>SAND (SM) | 1 |
| 2<br>3 | 2 | 24/24 | 2-4 | 5-6<br>7-5 | | | | |
| 4<br>5 | 3 | 24/18 | 4-6 | 4-5<br>5-5 | | | | |
| 6<br>7 | 4 | 24/24 | 6-8 | 1-1<br>2-2 | 1.0 tsf<br>1.0 tsf | Loose, brown, fine to medium SAND, little Silt, moist (SM). Changing at 5.5 feet to: Stiff, brown, CLAY & SILT, little fine to coarse Sand, moist (CL). | 5.5'<br>CLAY & SILT (CL) | |
| 8<br>9 | 5 | 24/22 | 8-10 | 2-3<br>2-2 | | Stiff, brown, CLAY & SILT, little fine Sand, moist (CL). | 8'<br>SAND (SM) | |
| 10<br>11 | 6 | 24/22 | 10-12 | 2-2<br>2-2 | | Loose, brown, fine to medium SAND, little Silt, moist (SM). | | |
| 12<br>13 | 7 | 24/22 | 12-14 | 2-5<br>9-11 | 2.0 tsf<br>>4.0 tsf | Very loose, brown, fine to medium SAND, little Silt, moist (SM). Changing at 11.9 feet to: Sitff, brown, CLAY & SILT, little fine to medium Sand, moist (CL). Hard, brown with gray mottling, CLAY & SILT, trace fine to coarse Sand, damp (CL). | 11.9'<br>CLAY & SILT (CL) | |
| 14<br>15 | 8 | 24/24 | 14-16 | 7-14<br>15-12 | >4.0 tsf | Hard, brown with gray mottling, CLAY & SILT, trace fine to coarse Sand, damp (CL). | | |
| 16<br>17 | 9 | 24/14 | 16-18 | 1-3<br>3-3 | | Loose, brown, fine to medium SAND, little Silt, moist (SM). | 16'<br>SAND (SM) | |
| 18<br>19 | 10 | 24/16 | 18-20 | 1-4<br>3-2 | 2.25 tsf | Very stiff, brown, CLAY & SILT, trace fine to coarse Sand, moist (CL). Changing at 19.5 feet to: Loose, brown, fine to medium SAND, little Silt, moist (SM). | 18'<br>CLAY & SILT (CL)<br>19.5' | |
| 20<br>21 | 11 | 24/4 | 20-22 | 4-6<br>3-3 | | Loose, brown, fine to medium SAND, little Silt, moist (SM). | SAND (SM) | |
| 22<br>23 | 12 | 24/24 | 22-24 | 1-7<br>7-7 | 2.25 tsf | Medium dense, brown, fine to medium Silty SAND, moist (SM). Changing at 22.9 feet to: Very stiff, brown, CLAY & SILT, little fine Sand, damp (CL). Changing at 23.8 feet to: Medium dense, brown, fine to medium SAND, little Silt, moist (SM). | 22.9'<br>CLAY & SILT (CL)<br>23.8' | |
| 24<br>25 | 13 | 24/12 | 24-26 | 1-1<br>1-1 | | | SAND (SM) | 2 |
| 26<br>27 | 14 | 24/24 | 26-28 | 1-5<br>7-10 | | Very loose, brown, fine to medium SAND, little Silt, wet (SM). Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 26'<br>SAND (SP) | |
| 28<br>29 | 15 | 24/18 | 28-30 | 8-9<br>10-11 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |

**Equipment Installed**




**REMARKS**

1. Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate consistency of cohesive soil.
2. Groundwater was encountered at approximately 24.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-11/MW-11D

BORING_WELL_6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-11/MW-11D
**Page:** 2 **of** 5
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | 16 | 24/10 | 30-32 | 2-5 8-14 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | SAND (SP) | | |
| 32 33 | 17 | 24/15 | 32-34 | 2-7 8-9 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 34 35 | 18 | 24/10 | 34-36 | 3-8 13-11 | | Medium dense, brown, fine to medium SAND, trace coarse Sand, trace Silt, wet (SP). | | | |
| 36 37 | 19 | 24/18 | 36-38 | 7-8 10-10 | | Medium dense, brown, fine to medium SAND, trace coarse Sand, trace Silt, wet (SP). Changing at 37.4 feet to: Medium dense, brown, fine SAND, little Silt, wet (SM). | 37.4' SAND (SM) | | |
| 38 39 | 20 | 24/18 | 38-40 | 2-2 5-6 | | Loose, brown, fine SAND, trace Silt, wet (SP). | 38' SAND (SP) | | |
| 40 41 | 21 | 24/12 | 40-42 | 2-2 5-12 | | Loose, brown, fine SAND, trace Silt, wet (SP). | | | |
| 42 43 | 22 | 24/16 | 42-44 | 2-4 5-7 | | Loose, brown, fine SAND, trace Silt, wet (SP). | | | |
| 44 45 | 23 | 24/18 | 44-46 | 3-8 9-10 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | | | |
| 46 47 | 24 | 24/24 | 46-48 | 2-7 7-9 | | Medium dense, brown, fine to coarse SAND, trace fine Gravel, trace Silt, wet (SW). | 46' SAND (SW) | | |
| 48 49 | 25 | 24/24 | 48-50 | 2-7 10-12 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). Changing at 49.2 feet to: Medium dense, brown, fine to coarse SAND, trace fine Gravel, trace Silt, wet (SW). | 48' SAND (SP) 49.2' SAND (SW) | | |
| 50 51 | 26 | 24/10 | 50-52 | 2-11 14-22 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | 50' SAND (SP) | | |
| 52 53 | 27 | 24/6 | 52-54 | 4-8 15-22 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | | 3 | |
| 54 55 | 28 | 24/14 | 54-56 | 2-4 7-11 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | | | |
| 56 57 | 29 | 24/24 | 56-58 | 2-4 6-6 | | Loose, brown, fine SAND, little Silt, wet (SM). | 56' SAND (SM) | | |
| 58 59 | 30 | 24/24 | 58-60 | 2-4 7-11 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | 58' SAND (SP) | | |
| 60 61 | 31 | 24/18 | 60-62 | 5-8 13-22 | | Medium dense, brown, fine SAND, some Silt, wet (SM). | 60' SAND (SM) | | |
| 62 63 | 32 | 24/20 | 62-64 | 3-6 8-10 | | Medium dense, brown, fine SAND, some Silt, wet (SM). | | | |
| 64 | 33 | 24/18 | 64-66 | 3-5 6-6 | | Medium dense, brown, fine SAND, some | | | |

**REMARKS**

3. Rock in tip.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-11/MW-11D
**Page:** 3 **of** 5
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Silt, wet (SM). | SAND (SM) | | |
| 66–67 | 34 | 24/22 | 66-68 | 3-7<br>13-11 | | Medium dense, brown, fine SAND, some Silt, wet (SM). Changing at 67.1 feet to: Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 67.1' SAND (SP) | | |
| 68–69 | 35 | 24/22 | 68-70 | 3-5<br>8-6 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). Changing at 68.8 feet to: Medium dense, brown, fine SAND, little Silt, wet (SM). | 68.8' SAND (SM) | | |
| 70–71 | 36 | 24/23 | 70-72 | 2-3<br>4-5 | | Loose, brown, fine SAND, trace Silt, wet (SP). | 70' SAND (SP) | | |
| 72–73 | 37 | 24/20 | 72-74 | 3-4<br>6-8 | | Loose, brown, fine SAND, trace Silt, wet (SP). | | | Grout |
| 74–75 | 38 | 24/24 | 74-76 | 3-3<br>5-9 | | Loose, brown, fine SAND, trace Silt, wet (SP). | | | |
| 76–77 | 39 | 24/0 | 76-78 | 6-10<br>15-13 | | NO RECOVERY. | 76' NO RECOVERY | | |
| 78–79 | 40 | 24/17 | 78-80 | 2-2<br>5-11 | | Loose, brown, fine SAND, trace Silt, wet (SP). | 78' SAND (SP) | | |
| 80–81 | 41 | 24/12 | 80-82 | 2-4<br>9-10 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | | | |
| 82–83 | 42 | 24/24 | 82-84 | 3-3<br>5-6 | | Loose, brown, fine SAND, trace Silt, wet (SP). | | | |
| 84–85 | 43 | 24/0 | 84-86 | 2-4<br>5-9 | | NO RECOVERY. | 84' NO RECOVERY | | |
| 86–87 | 44 | 24/18 | 86-88 | 1-2<br>5-12 | | Loose, brown, fine SAND, trace Silt, wet (SP). | 86' SAND (SP) | | |
| 88–89 | 45 | 24/8 | 88-90 | 6-5<br>8-11 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | | | |
| 90–91 | 46 | 24/18 | 90-92 | 2-4<br>7-11 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 92–93 | 47 | 24/0 | 92-94 | 2-3<br>6-10 | | NO RECOVERY. | 92' NO RECOVERY | | |
| 94–95 | 48 | 24/16 | 94-96 | 2-4<br>4-8 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). Changing at 95.8 feet to: Loose, brown fine SAND, little Silt, wet (SM). | 94' SAND (SP) 95.8' | | |
| 96–97 | 49 | 24/12 | 96-98 | 2-3<br>4-5 | | Loose, brown fine SAND, little Silt, wet (SM). | SAND (SM) | | |
| 98–99 | 50 | 24/16 | 98-100 | 2-3<br>6-8 | | Loose, brown, fine SAND, trace Silt, wet (SP). | 98' SAND (SP) | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-11/MW-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-11/MW-11D
**Page:** 4 **of** 5
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 101 | 51 | 24/4 | 100-102 | 2-5 10-14 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | SAND (SP) | | |
| 102 103 | 52 | 24/12 | 102-104 | 2-7 13-15 | | Medium dense, brown, fine SAND, trace Silt, wet (SP). | | | |
| 104 105 | 53 | 24/0 | 104-106 | 7-14 15-20 | | NO RECOVERY. | 104' NO RECOVERY | | |
| 106 107 | 54 | 24/19 | 106-108 | 1-3 8-13 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 106' SAND (SP) | | |
| 108 109 | 55 | 24/18 | 108-110 | 2-4 6-8 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 110 111 | 56 | 24/10 | 110-112 | 7-14 18-17 | | Dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 112 113 | 57 | 24/0 | 112-114 | 4-8 10-13 | | NO RECOVERY. | 112' NO RECOVERY | | |
| 114 115 | 58 | 24/10 | 114-116 | 8-10 11-15 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 114' SAND (SP) | | |
| 116 117 | 59 | 24/10 | 116-118 | 1-2 2-2 | | Very loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 118 119 | 60 | 24/19 | 118-120 | 2-2 5-7 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 120 121 | 61 | 24/21 | 120-122 | 2-2 5-7 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 122 123 | 62 | 24/23 | 122-124 | 2-2 7-8 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 124 125 | 63 | 24/20 | 124-126 | 6-7 10-13 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 126 127 | 64 | 24/20 | 126-128 | 3-3 4-4 | | Loose, brown, fine to medium SAND, trace Silt, wet (SP). Changing at 127.5 feet to: | | | |
| 128 129 | 65 | 24/12 | 128-130 | 3-4 12-14 | <0.25 tsf <0.25 tsf | Soft, gray, CLAY & SILT, little fine to medium Sand, moist (CL). Soft, gray, CLAY & SILT, little fine to medium Sand, moist (CL). Changing at 128.2 feet to: Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 127.5' 128.2 CLAY & SILT (CL) SAND (SP) | | |
| 130 131 | 66 | 24/9 | 130-132 | 2-5 13-15 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | | |
| 132 133 | 67 | 24/15 | 132-134 | 4-10 18-21 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). Changing at 133.2 feet to: Soft, gray, CLAY & SILT, some fine to medium Sand, moist (CL). Changing at 133.9 feet to: Medium dense, | 133.2' 133.9 CLAY & SILT (CL) SAND (SP) | | |
| 134 | 68 | 24/16 | 134-136 | 6-13 18-23 | 0.25 tsf | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-11/MW-11D

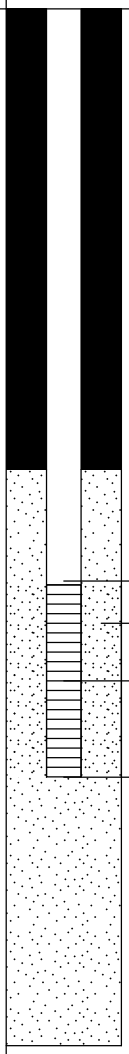
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** SB-11/MW-11D
**Page:** 5 **of** 5
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 136–137 | 69 | 24/14 | 136-138 | 2-4<br>12-15 | | brown, fine to medium SAND, trace Silt, wet (SP).<br>Dense, brown, fine to medium SAND, trace Silt, wet (SP). | SAND (SP) | |
| 138–139 | 70 | 24/8 | 138-140 | 3-10<br>20-21 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP).<br>Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 140–141 | 71 | 24/18 | 140-142 | 3-4<br>15-18 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 142–143 | 72 | 24/16 | 142-144 | 4-11<br>19-24 | | Medium dense, brown, fine to medium SAND, trace Silt, trace fine Gravel, wet (SP). | | |
| 144–145 | 73 | 24/18 | 144-146 | 11-13<br>23-33 | | Dense, brown, fine to coarse SAND, trace Silt, trace Gravel, wet (SW). | 144'<br>SAND (SW) | |
| 146–147 | 74 | 24/10 | 146-148 | 9-13<br>30-30 | | Dense, brown, fine to medium SAND, trace Silt, trace coarse Sand, wet (SP). | 146'<br>SAND (SP) | |
| 148–149 | 75 | 24/10 | 148-150 | 9-18<br>26-34 | | Dense, brown, fine to medium SAND, trace Silt, trace coarse Sand, wet (SP). | | |
| 150–151 | 76 | 24/21 | 150-152 | 9-23<br>29-40 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | |
| 152–153 | 77 | 18/18 | 152-153.5 | 25-42-50 | | Very dense, brown, fine to medium SAND, trace Silt, wet (SP). | | 4 |
| 154–155 | 78 | 24/24 | 154-156 | 11-13<br>15-18 | | Medium dense, brown, fine to medium SAND, some Silt, wet (SM). | 154'<br>SAND (SM) | |
| 156–157 | 79 | 24/24 | 156-158 | 7-17<br>37-30 | | Very dense, brown, fine SAND, some Silt, wet (SM). Changing at 157.7 feet to: Hard, gray, CLAY & SILT, little fine Sand, moist (CL). | 157.7'<br>CLAY & SILT (CL) | |
| 158–159 | 80 | 24/24 | 158-160 | 8-18<br>27-26 | >4.0 tsf<br>>4.0 tsf | Hard, gray, CLAY & SILT, little fine Sand, moist (CL). Changing at 159.1 feet to: Dense, gray, fine SAND, some Silt, wet (SM). Changing at 159.9 feet to: Hard, gray, CLAY & SILT, little fine Sand, moist (CL). | 159.1'<br>SAND (SM) | |
| 160–161 | 81 | 24/24 | 160-162 | 6-10<br>18-20 | >4.0 tsf<br>>4.0 tsf | | 159.9'<br>CLAY & SILT (CL) | |
| 162 | | | | | | Hard, gray, CLAY & SILT, some fine Sand, moist (CL).<br>Bottom of Borehole at 162.0 Feet | 162' | 5 |
| 163–169 | | | | | | | | |

**Equipment Installed**




**REMARKS**

4. Only drove spoon 18 inches due to high blow counts.
5. Monitoring well was installed in borehole upon completion. Well screen set from 150.0 to 155.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-11/MW-11D

BORING_WELL_6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-11M
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Julie Groenleer/Joe Workman
**Date Start/Finish:** 11-8-17 / 11-9-17
**Boring Location:**
**GS Elev.:** 742.30' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

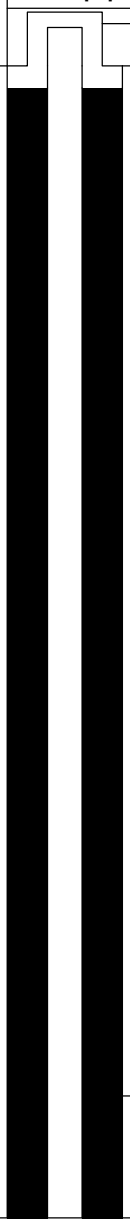
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–51 | | | | | | See SB-11/MW-11D boring log for sample description and classification. | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

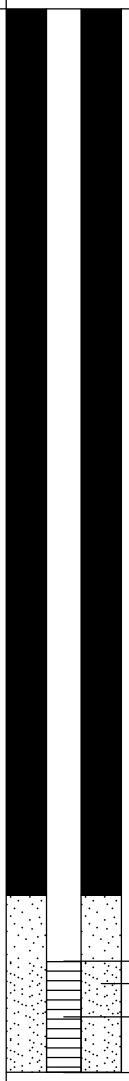
**Boring No.:** MW-11M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-11M
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Jim Cai

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 53–99 | | | | | | | | | |
| 100 | | | | | | Bottom of Borehole at 100.0 Feet | | 1 | |
| 101–112 | | | | | | | | | |




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 95.0 to 10.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-11M

BORING_WELL_6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
US 131
Belmont, Michigan

**Boring No.:** MW-11S
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Jim Cai

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Joe Workman
**Date Start/Finish:** 11-9-17 / 11-9-17
**Boring Location:**
**GS Elev.:** 742.10' **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

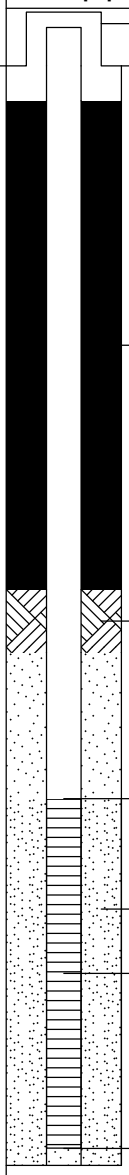
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–31 | | | | | | See SB-11/MW-11D boring log for sample description and classification. | | |
| 32 | | | | | | Bottom of Borehole at 31.5 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 21.0 to 31.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-11S

BORING_WELL 6233552 WWW US 131 SB-9 THROUGH SB-11.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12A
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** J. Markosky
**Date Start/Finish:**
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

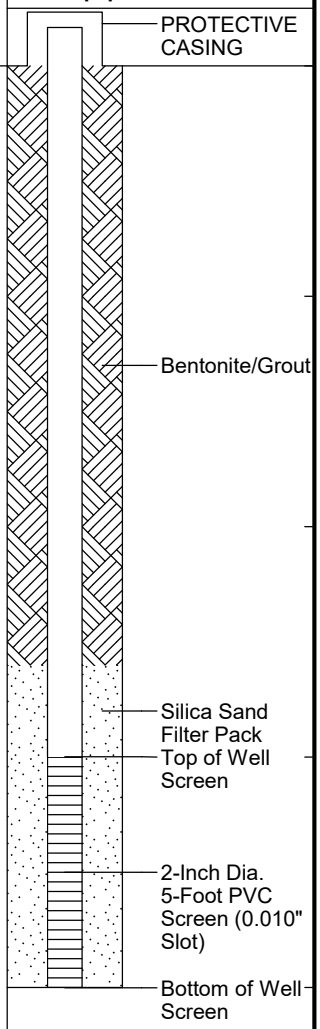
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–19 | | | | | | See HS-MW-12D for detailed soil descriptions. | | |
| 20 | | | | | | Bottom of Borehole at 20.0 Feet | | 1 |
| 21–24 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well HS-MW-12A was installed in borehole upon completion. Well screen set from approximately 15.0 to 20.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12A

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12B
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** J. Markosky
**Date Start/Finish:**
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

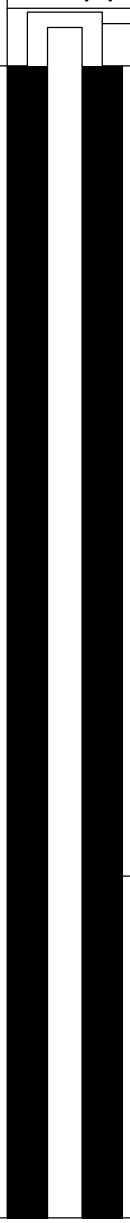
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-12D for detailed soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

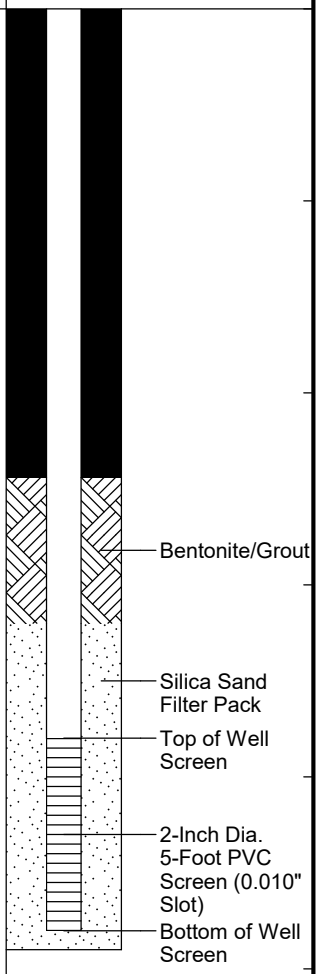
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12B
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | Bottom of Borehole at 54.5 Feet | | 1 |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | | | |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well HS-MW-12B was installed in borehole upon completion. Well screen set from approximately 49.0 to 54.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12B

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12C
**Page:** 1 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** J. Markosky
**Date Start/Finish:** 9-3-19 / 9-20-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-12D for detailed soil descriptions. | | | PROTECTIVE CASING |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12C

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12C
**Page:** 2 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | Grout |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12C

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12C
**Page:** 3 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information | | | | | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12C

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12C
**Page:** 4 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | | | | | | | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | | | | | | | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | |
| 119 | | | | | | | | | |
| 120 | | | | | | | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | |
| 123 | | | | | | | | | Silica Sand Filter Pack |
| 124 | | | | | | | | | Top of Well Screen |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | | | | | | | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | Bottom of Borehole at 130.4 Feet | | 1 | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | | | | | | | | | |

**REMARKS**

1. Monitoring well HS-MW-12C was installed in borehole upon completion. Well screen set from approximately 124.0 to 128.8 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12C

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12D
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** J. Markosky
**Date Start/Finish:** 9-3-19 / 9-20-19
**Boring Location:**
**GS Elev.:** **Datum:**

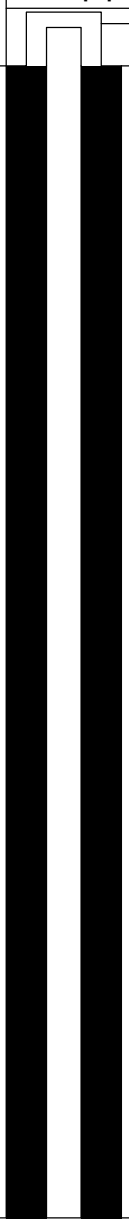
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/12 | 0-2 | 1-1 3-3 | 0.0 ppm | Black, TOPSOIL. Changing at 0.5 feet to: Loose, light brown, fine SAND, some Silt, dry. | 0.5' TOPSOIL SAND | 1 |
| 2 3 | 2 | 24/8 | 2-4 | 2-3 2-3 | 0.0 ppm | Loose, light brown, fine to medium SAND, little Silt, dry. | | |
| 4 5 | 3 | 24/14 | 4-6 | 3-4 4-5 | 0.0 ppm | Loose, light brown, fine to medium SAND, little Silt, dry. | | |
| 6 7 | 4 | 24/16 | 6-8 | 2-3 3-3 | 0.0 ppm | Loose, light brown, fine to medium SAND, little Silt, moist. | | |
| 8 9 | 5 | 24/18 | 8-10 | 1-2 2-2 | 0.0 ppm | Loose, brown, fine to medium SAND, little Silt, damp. | | |
| 10 11 | 6 | 24/22 | 10-12 | 1-3 4-5 | 0.0 ppm | Loose, brown, fine to medium SAND, little Silt, wet. | | |
| 12 13 | 7 | 24/14 | 12-14 | 2-2 1-2 | 0.0 ppm | Loose, brown, fine to medium SAND, some Silt, wet. | | |
| 14 15 | 8 | 24/11 | 14-16 | WOH-1 5-8 | 0.0 ppm | Loose, brown, fine to medium SAND, little Silt, wet. | | 2 3 |
| 16 17 | 9 | 24/16 | 16-18 | 4-5 8-9 | 0.0 ppm | Loose, brown, fine to medium SAND, little Silt, wet. | | |
| 18 19 | 10 | 24/24 | 18-20 | 1-4 9-10 | 0.0 ppm | Loose, brown, fine to medium SAND, little Silt, wet. | | |
| 20 21 | 11 | 24/23 | 20-22 | 3-4 7-11 | 0.0 ppm | Loose, brown, fine to medium SAND, little Silt, wet. | | |
| 22 23 | 12 | 24/20 | 22-24 | 3-6 9-12 | 0.0 ppm | Medium dense, brown, fine to medium SAND, little Silt, trace Gravel, wet. | | |
| 24 25 | 13 | 24/20 | 24-26 | 4-6 10-9 | 0.0 ppm | Medium dense, brown, fine to medium SAND, little Silt, trace Gravel, wet. | | 4 |
| 26 27 | 14 | 24/23 | 26-28 | 1-2 2-3 | 0.0 ppm | Loose, brown, fine to medium SAND, little Silt, trace Gravel, wet. | | |
| 28 29 | 15 | 24/24 | 28-30 | 1-3 3-5 | 0.0 ppm | Loose, brown, fine to medium SAND, some Silt, wet. | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.
2. Groundwater was encountered at approximately 14.0 feet below ground surface.
3. Temporary well set at 15.0 to 20.0 feet below ground surface. Purged 55.0 gallons. Groundwater sample submitted for laboratory analysis.
4. Temporary well set at 25.0 to 30.0 feet below ground surface. Purged 50.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12D
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | 16 | 24/24 | 30-32 | 1-3 3-5 | 0.0 ppm | Loose, brown, fine to medium SAND, some Silt, wet. | SAND | | |
| 32 33 | 17 | 24/20 | 32-34 | 2-5 5-6 | 0.0 ppm | Loose, brown, fine to medium SAND, some Silt, wet. | | | |
| 34 35 | 18 | 24/18 | 34-36 | 1-2 3-5 | 0.0 ppm | Loose, brown, fine to medium SAND, some Silt, wet. | | 5 | |
| 36 37 | 19 | 24/9 | 36-38 | 3-8 12-14 | 0.0 ppm | Medium dense, brown, fine to medium SAND, some Silt, wet. | | | |
| 38 39 | 20 | 24/20 | 38-40 | 2-4 5-10 | 0.0 ppm | Loose, brown and gray, fine to medium SAND, some Silt, wet. | | | |
| 40 41 | 21 | 24/24 | 40-42 | 1-3 5-6 | 0.0 ppm | Loose, brown and gray, fine to medium SAND, some Silt, wet. Changing at 41.6 feet to: Gray, Silty CLAY, some fine Sand, wet. | 41.8' Silty CLAY | | |
| 42 43 | 22 | 24/24 | 42-44 | 4-8 10-13 | 0.0 ppm | Gray, Silty CLAY, some fine to medium Sand, dry. | | 6 | |
| 44 45 | 23 | 24/24 | 44-46 | 3-11 11-13 | 0.0 ppm | Very stiff, gray, SILT & CLAY, little fine Sand, wet. | 44' SILT & CLAY | | |
| 46 47 | 24 | 24/2 | 46-48 | 1-1 1-2 | 0.0 ppm | Very loose, brown and gray, fine to medium SANd, little Silt, wet. | 46' SAND | | |
| 48 49 | 25 | 24/20 | 48-50 | 2-5 8-12 | 0.0 ppm | Medium dense, brown, fine to medium SAND, trace Silt, wet. Changing at 49.0 feet to: Medium dense, brown, fine to medim SAND, trace Silt with layers of interbedded Silty Clay, wet. | | 7 | |
| 50 51 | 26 | 24/14 | 50-52 | 1-7 11-14 | 0.0 ppm | Medium dense, brown, fine to medium SAND, little Silt with interbedded Silty Clay, wet. | | | |
| 52 53 | 27 | 24/0 | 52-54 | 9-30 43-29 | 0.0 ppm | NO RECOVERY. | | | |
| 54 55 | 28 | 24/24 | 54-56 | 4-9 11-12 | 0.0 ppm | Medium dense, brown, fine to medium SAND, little Silt, wet. Changing at 54.5 feet to: Gray, Silty CLAY, trace fine Sand, dry. | 54.5' Silty CLAY | | |
| 56 57 | 29 | 24/24 | 56-58 | 8-13 13-15 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine Sand, dry. | | | |
| 58 59 | 30 | 24/24 | 58-60 | 4-8 10-10 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine Sand, dry. | | | |
| 60 61 | 31 | 24/24 | 60-62 | 6-8 9-11 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine Sand, dry. | | | |
| 62 63 | 32 | 24/24 | 62-64 | 4-10 10-11 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine Sand, dry. | | | |
| 64 | 33 | 24/24 | 64-66 | 6-11 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine Sand, | | | |

**REMARKS**

5. Temporary well set at 35.0 to 40.0 feet below ground surface. Purged 70.0 gallons. Groundwater sample submitted for laboratory analysis.
6. 10.0 inch casing set to 42.6 feet below ground surface.
7. Temporary well set at 49.0 to 54.0 feet below ground surface. Purged 75.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12D
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 15-16 | | dry. | Silty CLAY | | |
| 66–67 | 34 | 24/24 | 66-68 | 3-9 10-10 | 0.0 ppm | Very stiff, gray, Silty CLAY, trace fine Sand, dry. | | | |
| 68–69 | 35 | 24/24 | 68-70 | 6-6 9-11 | 0.0 ppm | Very stiff, gray, Silty CLAY, trace fine Sand, dry. | | | |
| 70–71 | 36 | 24/24 | 70-72 | 2-2 2-5 | 0.0 ppm | Very stiff, gray, Silty CLAY, trace fine Sand, dry. Changing at 71.0 feet to: Gray, fine SANd, some Silt, wet. | 71' SAND | | |
| 72–73 | 37 | 24/16 | 72-74 | 1-1 2-2 | 0.0 ppm | Very loose, gray and brown, fine to medium SAND, some Silt, wet. | | | |
| 74–75 | 38 | 24/20 | 74-76 | 3-3 7-11 | 0.0 ppm | Loose, gray and brown, fine SAND, some Silt, wet. | | 8 | |
| 76–77 | 39 | 24/24 | 76-78 | 2-3 5-7 | 0.0 ppm | Loose, gray and brown, fine SAND, some Silt, wet. | | | Grout |
| 78–79 | 40 | 24/13 | 78-80 | 1-1 4-5 | 0.0 ppm | Loose, gray and brown, fine SAND, some Silt, wet. | | | |
| 80–81 | 41 | 24/24 | 80-82 | 1-1 3-5 | 0.0 ppm | Loose, gray and brown, fine SAND, some Silt, wet. | | | |
| 82–83 | 42 | 24/18 | 82-84 | 1-3 8-11 | 0.0 ppm | Medium dense, gray and brown, fine to medium SAND, some Silt, wet. Changing at 83.3 feet to: Gray and brown, fine to medium SAND, some Silt, little Gravel, wet. | | | |
| 84–85 | 43 | 24/20 | 84-86 | 2-5 6-7 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, some Gravel, trace Silt, wet. | | 9 | |
| 86–87 | 44 | 24/24 | 86-88 | 2-4 12-20 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, some Gravel, trace Silt, wet. | | | |
| 88–89 | 45 | 24/17 | 88-90 | 3-5 9-13 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | | |
| 90–91 | 46 | 24/92 | 90-92 | 1-4 7-14 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | | |
| 92–93 | 47 | 24/7 | 92-94 | 1-1 2-8 | 0.0 ppm | Very loose, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | | |
| 94–95 | 48 | 24/11 | 94-96 | 3-10 14-22 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | 10 | |
| 96–97 | 49 | 24/12 | 96-98 | 1-3 6-7 | 0.0 ppm | Loose, brown and gray, fine to coarse SAND, little Silt, trace Gravel, wet. | | | |
| 98–99 | 50 | 24/15 | 98-100 | 3-3 12-17 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, little Silt, trace Gravel, wet. | | | |

**REMARKS**

8. Temporary well set at 75.0 to 80.0 feet below ground surface. Purged 80.0 gallons. Groundwater sample submitted for laboratory analysis.
9. Temporary well set at 85.0 to 90.0 feet below ground surface. Purged 55.0 gallons. Groundwater sample submitted for laboratory analysis.
10. Temporary well set at 95.0 to 100.0 feet below ground surface. Purged 85.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12D
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 51 | 24/5 | 100-102 | 1-4<br>4-8 | 0.0 ppm | Loose, brown and gray, fine to coarse SAND, little Silt, little Gravel, wet. | SAND | | |
| 101<br>102 | 52 | 24/12 | 102-104 | 3-10<br>15-15 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, little Silt, little Gravel, wet. | | | |
| 103<br>104 | 53 | 24/14 | 104-106 | 2-5<br>10-19 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, little Silt, little Gravel, wet. | | | |
| 105<br>106 | 54 | 24/8 | 106-108 | 1-3<br>3-11 | 0.0 ppm | Loose, brown, fine to coarse SAND, little Silt, wet. | | 11 | |
| 107<br>108 | 55 | 24/16 | 108-110 | 1-2<br>5-12 | 0.0 ppm | Loose, brown, fine to coarse SAND, little Silt, wet. Changing at 108.4 feet to: Brown, fine to medium SAND, little Silt, wet. | | | |
| 109<br>110 | 56 | 24/15 | 110-112 | 1-3<br>3-9 | 0.0 ppm | Loose, brown, fine to medium SAND, little Silt, wet. | | | |
| 111<br>112 | 57 | 24/16 | 112-114 | 1-12<br>20-24 | 0.0 ppm | Dense, brown, fine to medium SAND, little Silt, wet. | | | |
| 113<br>114 | 58 | 24/13 | 114-116 | 1-5<br>11-16 | 0.0 ppm | Medium dense, brown, fine to medium SAND, little Silt, trace Gravel, wet. | | | |
| 115<br>116 | 60 | 24/23 | 116-118 | 3-14<br>25-38 | 0.0 ppm | Dense, brown, fine to medium SAND, little Silt, trace Gravel, wet. Changing at 117.8 feet to: Brown, fine to coarse SAND, some Gravel, little Silt, wet. | | 12 | |
| 117<br>118 | 61 | 24/9 | 118-120 | 12-19<br>17-17 | 0.0 ppm | Dense, brown, fine to coarse SAND, some Silt, little Gravel, wet. | | | |
| 119<br>120 | 62 | 24/8 | 120-122 | 3-5<br>13-15 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, little Silt, little Gravel, wet. | | | |
| 121<br>122 | 63 | 24/12 | 122-124 | 5-9<br>14-22 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, little Silt, little Gravel, wet. | | | |
| 123<br>124 | 64 | 24/14 | 124-126 | 6-15<br>23-26 | 0.0 ppm | Dense, brown, fine to coarse SAND, some Gravel, little Siilt, wet. | | | |
| 125<br>126 | 65 | 24/7 | 126-128 | 7-17<br>24-16 | 0.0 ppm | Dense, brown, fine to coarse SAND, some Gravel, little Siilt, wet. | | 13 | |
| 127<br>128 | 66 | 24/9 | 128-130 | 7-18<br>45-41 | 0.0 ppm | Very dense, brown, fine to coarse SAND, some Gravel, little Siilt, wet. | | | |
| 129<br>130 | 67 | 12/12 | 130-131 | 17-50/6" | 0.0 ppm | Very dense, brown, fine to coarse SAND, some Gravel, little Siilt, wet. | | | |
| 131<br>132 | 68 | 24/9 | 132-134 | 30-33<br>14-10 | 0.0 ppm | Dense, brown, fine to coarse SAND, some Gravel, little Silt, wet. | | | |
| 133<br>134 | 70 | 24/20 | 134-136 | 15-30 | 0.0 ppm | Very dense, brown, fine to coarse SAND, | | | |

**REMARKS**

11. Temporary well set at 105.0 to 110.0 feet below ground surface. Purged 65.0 gallons. Groundwater sample submitted for laboratory analysis.
12. Temporary well set at 115.0 to 120.0 feet below ground surface. Purged 100.0 gallons. Groundwater sample submitted for laboratory analysis.
13. Temporary well set at 125.0 to 130.0 feet below ground surface. Purged 65.0 gallons. Groundwater sample submitted for laboratory analysis.
14. Temporary well set at 135.0 to 140.0 feet below ground surface. Purged - gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12D

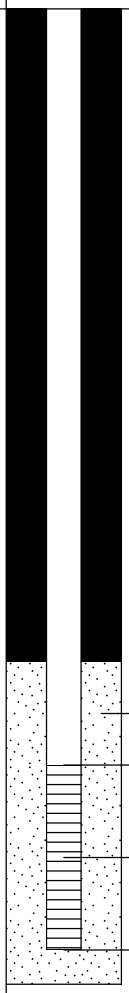
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12D
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | 30-21 | | some Gravel, little Silt, wet. | SAND | 14 |
| 136–137 | 71 | 24/9 | 136-138 | 18-23 21-20 | 0.0 ppm | Dense, brown, fine to coarse SAND, some Gravel, little Silt, wet. | | |
| 138–139 | 72 | 24/13 | 138-140 | 10-15 16-17 | 0.0 ppm | Dense, brown, fine to coarse SAND, some Gravel, little Silt, wet. | | |
| 140–141 | 73 | 17/9 | 140-141.4 | 1-39-50/5 | 0.0 ppm | Very dense, brown, fine to coarse SAND, some Gravel, little Silt, wet. | | |
| 142–143 | 74 | 17/12 | 142-143.4 | 1-34-50/5 | 0.0 ppm | Very dense, brown, fine to coarse SAND, some Gravel, little Silt, wet. Changing at 142.6 feet to: Brown, fine SANd, some Silt, wet. | | |
| 144–145 | 75 | 12/12 | 144-145 | 10-50/6" | 0.0 ppm | Very dense, brown, fine SAND, some Silt, trace Gravel, wet. | | |
| 146–147 | 76 | 18/7 | 146-147.5 | 4-15-50/6" | 0.0 ppm | Very dense, brown, fine SAND, some Silt, trace Gravel, wet. | | |
| 148–149 | 77 | 10/2 | 148-148.8 | 20-50/4" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | | |
| 150–151 | 78 | 6/6 | 150-150.5 | 50/6" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | | |
| 152–153 | 79 | 12/10 | 152-153 | 6-50/6" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | | |
| 154–155 | 80 | 11/11 | 154-154.9 | 29-50/5" | 0.0 ppm | Very dense, brown, fine SAND, little Silt, wet. | | 15 |
| 156–157 | 81 | 11/11 | 156-156.9 | 19-50/5" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, trace Gravel, wet. | | |
| 158–159 | 82 | 12/11 | 158-159 | 27-50/6" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, trace Gravel, wet. | | |
| 160–161 | 83 | 18/18 | 160-161.5 | 5-19-50/6" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, trace Gravel, wet. | | |
| 162–163 | 84 | 24/20 | 162-164 | 2-8 14-14 | 0.0 ppm | Medium dense, brown, fine to medium SAND, little Silt, wet. | | |
| 164–165 | 85 | 12/12 | 164-165 | 15-50/6" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | | 16 |
| 166–167 | 86 | 23/14 | 166-167.9 | 3-10 30-50/5" | 0.0 ppm | Dense, brown, fine to medium SAND, little Silt, wet. | | |
| 168–169 | 87 | 23/2 | 168-169.9 | 3-13 37-50/5" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | | |

**Equipment Installed**




**REMARKS**

15. Temporary well set at 155.0 to 160.0 feet below ground surface. Purged 55.0 gallons. Groundwater sample submitted for laboratory analysis.
16. Temporary well set at 165.0 to 170.0 feet below ground surface. Purged 75.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12D
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 171 | 88 | 18/14 | 170-171.5 | 1-16-50/6" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | SAND | | |
| 172–173 | 90 | 12/12 | 172-173 | 11-22 | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | | | |
| 174–175 | 91 | 14/14 | 174-175.2 | 26-49-50/2 | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, with small, interbedded Silty Clay layers, wet. | | 17 | |
| 176–177 | 92 | 12/12 | 176-177 | 16-50/6" | 0.0 ppm | Very dense, brown, fine SAND, some Silt, wet. | | | |
| 178–179 | 93 | 18/18 | 178-179.5 | 20-27-50/6 | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. Changing at 178.9 feet to: Brown, fine SANd, some Silt, wet. | | | |
| 180–181 | 94 | 16/14 | 180-181.3 | 6-24-50/4" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | | | |
| 182–183 | 95 | 21/21 | 182-183.8 | 12-23 44-50/3" | 0.0 ppm | Very dense, brown, fine to medium SAND, little Silt, wet. | | | |
| 184–185 | 96 | 10/10 | 184-184.8 | 29-50/4" | 0.0 ppm | Hard, gray, Silty CLAY, some fine to medium Sand, wet. Changing at 184.2 feet to: Brown and gray, fine to medium SAND, little Silt, wet. | 184' 184.2 Silty CLAY SAND | 18 | |
| 186–187 | 97 | 17/17 | 186-187.4 | 18-29-50/5 | 0.0 ppm | Very dense, brown and gray, fine to medium SAND, some Silt, wet. | | | |
| 188–189 | 98 | 24/24 | 188-190 | 9-34 44-40 | 0.0 ppm | Very dense, brown and gray, fine to medium SAND, some Silt, wet. Changing at 189.0 feet to: Gray, Silty CLAY, little fine Sand, wet. | 189' Silty CLAY | | |
| 190–191 | 99 | 24/24 | 190-192 | 15021-29-4 | 0.0 ppm | Hard, gray, Silty CLAY, some fine to medium Sand, wet. Changing at 190.5 feet to: Brown and gray, fine to medium SAND, some Silt, wet. | 190.5' SAND | | |
| 192–193 | 100 | 17/17 | 192-193.4 | 18-30-50/5 | 0.0 ppm | Hard, gray, Silty CLAY, litle fine Sand, dry (weathered Bedrock). | 192' Silty CLAY | | |
| 194 | | | | | | Bottom of Borehole at 194.0 Feet | 194' | 19 | |

**REMARKS**

17. Temporary well set at 175.0 to 180.0 feet below ground surface. Purged 70.0 gallons. Groundwater sample submitted for laboratory analysis.
18. Temporary well set at 185.0 to 190.0 feet below ground surface. Purged 60.0 gallons. Groundwater sample submitted for laboratory analysis.
19. Monitoring well was installed in borehole upon completion. Well screen set from 154.7 to 159.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12D

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12E
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** J. Markosky
**Date Start/Finish:** 9-3-19 / 9-20-19
**Boring Location:**
**GS Elev.:** **Datum:**

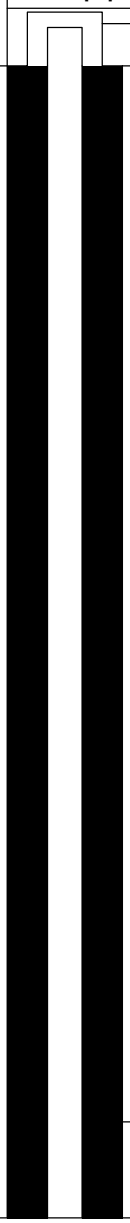
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-12D for detailed soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | Bottom of Borehole at 194.0 Feet | | 1 |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well HS-MW-12E was installed in borehole upon completion. Well screen set from approximately 184.0 to 189.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12E

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12E
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12E

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12E
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12E

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12E
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | | | | | | | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | | | | | | | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | Bentonite/Grout |
| 119 | | | | | | | | | |
| 120 | | | | | | | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | |
| 123 | | | | | | | | | |
| 124 | | | | | | | | | |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | | | | | | | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12E

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12E
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information | | | | | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | | | | |
| 136 | | | | | | | | | |
| 137 | | | | | | | | | |
| 138 | | | | | | | | | |
| 139 | | | | | | | | | |
| 140 | | | | | | | | | |
| 141 | | | | | | | | | |
| 142 | | | | | | | | | |
| 143 | | | | | | | | | |
| 144 | | | | | | | | | |
| 145 | | | | | | | | | |
| 146 | | | | | | | | | |
| 147 | | | | | | | | | |
| 148 | | | | | | | | | |
| 149 | | | | | | | | | |
| 150 | | | | | | | | | |
| 151 | | | | | | | | | |
| 152 | | | | | | | | | |
| 153 | | | | | | | | | |
| 154 | | | | | | | | | |
| 155 | | | | | | | | | |
| 156 | | | | | | | | | |
| 157 | | | | | | | | | |
| 158 | | | | | | | | | |
| 159 | | | | | | | | | |
| 160 | | | | | | | | | |
| 161 | | | | | | | | | |
| 162 | | | | | | | | | |
| 163 | | | | | | | | | |
| 164 | | | | | | | | | |
| 165 | | | | | | | | | |
| 166 | | | | | | | | | |
| 167 | | | | | | | | | |
| 168 | | | | | | | | | |
| 169 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

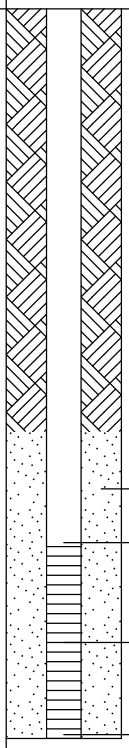
**Boring No.:** HS-MW-12E

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-12E
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 171 | | | | | | | | | |
| 172 | | | | | | | | | |
| 173 | | | | | | | | | |
| 174 | | | | | | | | | |
| 175 | | | | | | | | | |
| 176 | | | | | | | | | |
| 177 | | | | | | | | | |
| 178 | | | | | | | | | |
| 179 | | | | | | | | | |
| 180 | | | | | | | | | |
| 181 | | | | | | | | | |
| 182 | | | | | | | | | |
| 183 | | | | | | | | | Silica Sand Filter Pack |
| 184 | | | | | | | | | Top of Well Screen |
| 185 | | | | | | | | | |
| 186 | | | | | | | | | |
| 187 | | | | | | | | | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 188 | | | | | | | | | |
| 189 | | | | | | | | | Bottom of Well Screen |
| 190 | | | | | | | | | |
| 191 | | | | | | | | | |
| 192 | | | | | | | | | |
| 193 | | | | | | | | | |
| 194 | | | | | | | | | |
| 195 | | | | | | | | | |
| 196 | | | | | | | | | |
| 197 | | | | | | | | | |
| 198 | | | | | | | | | |
| 199 | | | | | | | | | |
| 200 | | | | | | | | | |
| 201 | | | | | | | | | |
| 202 | | | | | | | | | |
| 203 | | | | | | | | | |
| 204 | | | | | | | | | |



**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-12E

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13A
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 1-14-20 / 1-14-20
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

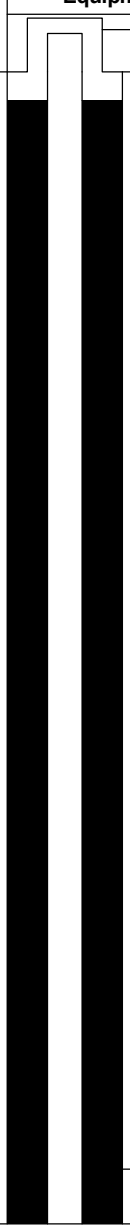
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-13C for detailed soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-13A

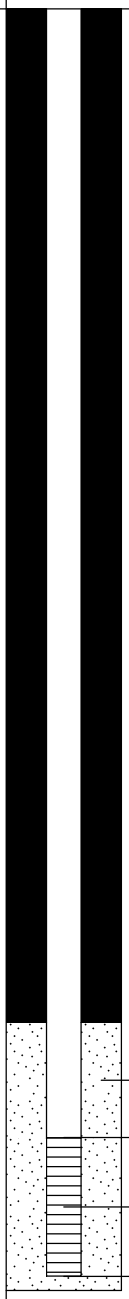
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13A
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 41–84 | | | | | | | | |
| 85 | | | | | | Bottom of Borehole at 84.5 Feet | | 1 |
| 86 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well HS-MW-13A was installed in borehole upon completion. Well screen set from approximately 79.2 to 84.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-13A

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13B
**Page:** 1 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 1-13-20 / 1-14-20
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

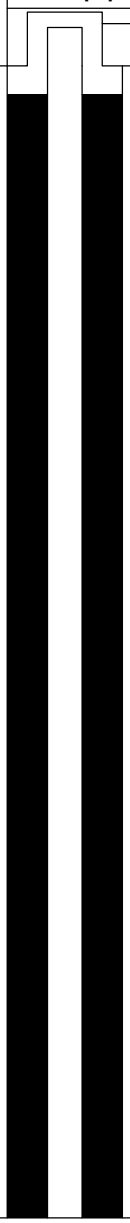
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-13C for detailed soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13B
**Page:** 2 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | Bentonite/Grout |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13B
**Page:** 3 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information | | | | | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | | | | | | | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | | | | | | | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | |
| 119 | | | | | | | | | |
| 120 | | | | | | | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | |
| 123 | | | | | | | | | |
| 124 | | | | | | | | | |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | | | | | | | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

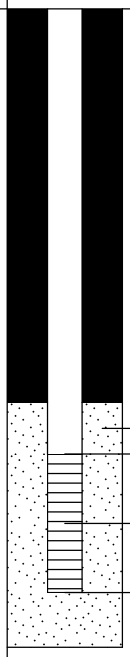
**Boring No.:** HS-MW-13B

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13B
**Page:** 4 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 134–155 | | | | | | | | | Silica Sand Filter Pack; Top of Well Screen; 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot); Bottom of Well Screen |
| 156 | | | | | | Bottom of Borehole at 155.5 Feet | | 1 | |
| 157–179 | | | | | | | | | |




**REMARKS**

1. Monitoring well HS-MW-13B was installed in borehole upon completion. Well screen set from approximately 148.8 to 153.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-13B

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 1 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 12-16-19 / 12-17-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

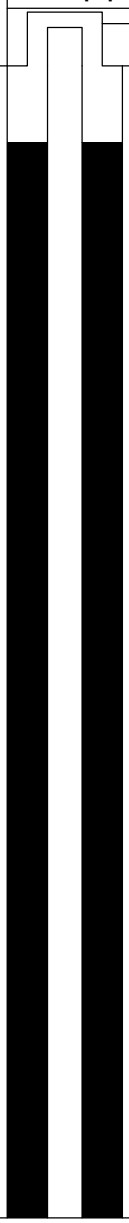
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/11 | 0-2 | 1-2<br>2-1 | | Dark brown to dark yellowish brown, fine SAND, some Silt, moist. Changing at 0.2 feet to: Yellowish brown, fine SAND, some Silt, moist. Changing at 0.9 feet to: NO RECOVERY. | SAND<br>0.9'<br>NO RECOVERY | |
| 1 | | | | | | | | |
| 2 | 2 | 24/1 | 2-4 | 4-2<br>3-6 | | Yellowish brown, fine SAND, little Silt, moist. Changing at 2.1 feet to: NO RECOVERY. | 2'<br>2.1' SAND<br>NO RECOVERY | |
| 3 | | | | | | | | |
| 4 | 3 | 24/11 | 4-6 | 2-4<br>5-7 | | Light yellowish brown, fine SAND, trace Silt, moist. Changing at 4.9 feet to: NO RECOVERY. | 4'<br>SAND<br>4.9'<br>NO RECOVERY | |
| 5 | | | | | | | | |
| 6 | 4 | 24/13 | 6-8 | 5-6<br>7-8 | | Dark yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 6.7 feet to: Dark yellowish brown, SILT, thin seams of Silty Clay, moist. Changing at 6.9 feet to: Dark yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 7.1 feet to: NO RECOVERY. | 6'<br>SAND<br>6.7'<br>6.9' SILT<br>7.1' SAND<br>NO RECOVERY | |
| 7 | | | | | | | | |
| 8 | 5 | 24/16 | 8-10 | 6-4<br>5-6 | | Dark yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 9.3 feet to: NO RECOVERY. | 8'<br>SAND<br>9.3'<br>NO RECOVERY | |
| 9 | | | | | | | | |
| 10 | 6 | 24/12 | 10-12 | 4-8<br>8-10 | | Dark yellowish brown, fine SAND, some Silt, moist. Changing at 10.5 feet to: Yellowish brown, SILT, moist. Changing at 11.6 feet to: Pale brown, fine SAND, trace Silt, moist. Changing at 11.8 feet to: NO RECOVERY. | 10'<br>SAND<br>10.5'<br>SILT<br>11.6'<br>11.8' SAND | |
| 11 | | | | | | | | |
| 12 | 7 | 24/17 | 12-14 | 6-8<br>9-11 | | Pale brown, fine SAND, trace Silt, moist. Changing at 13.4 feet to: NO RECOVERY. | 12'<br>NO RECOVERY<br>SAND<br>13.4'<br>NO RECOVERY | |
| 13 | | | | | | | | |
| 14 | 8 | 24/14 | 14-16 | 5-8<br>10-12 | | Pale brown, fine SAND, trace Silt, moist. Changing at 15.2 feet to: NO RECOVERY. | 14'<br>SAND | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 2 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 15.2' NO RECOVERY | | |
| 16 | 9 | 24/12 | 16-18 | 3-7 7-6 | | Pale brown, fine SAND, trace Silt, moist. Changing at 17.0 feet to: NO RECOVERY. | 16' SAND | | |
| 17 | | | | | | | 17' NO RECOVERY | | |
| 18 | 10 | 24/17 | 18-20 | 5-6 9-10 | | Pale brown, fine SAND, trace Silt, moist. Changing at 18.5 feet to: Pale brown, fine SAND, trace Silt, very thin lenses of Silt, moist. Changing at 19.4 feet to: NO RECOVERY. | 18' SAND | | |
| 19 | | | | | | | 19.4' NO RECOVERY | | |
| 20 | 11 | 24/17 | 20-22 | 7-9 11-11 | | Pale brown, fine SAND, trace Silt, moist. Changing at 21.2 feet to: Yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 21.4 feet to: NO RECOVERY. | 20' SAND | | |
| 21 | | | | | | | 21.4' NO RECOVERY | | |
| 22 | 12 | 24/18 | 22-24 | 5-8 11-14 | | Yellowish brown, fine SAND, trace Silt, moist. Changing at 23.5 feet to: NO RECOVERY. | 22' SAND | | |
| 23 | | | | | | | 23.5' NO RECOVERY | | |
| 24 | 13 | 24/18 | 24-26 | 13-14 12-18 | | Yellowish brown, fine SAND, trace Silt, grading to fine to medium SAND, trace Silt, moist. Changing at 25.5 feet to: NO RECOVERY. | 24' SAND | | |
| 25 | | | | | | | 25.5' NO RECOVERY | | |
| 26 | 14 | 24/19 | 26-28 | 6-15 17-18 | | Yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 27.6 feet to: NO RECOVERY. | 26' SAND | | |
| 27 | | | | | | | 27.6' NO RECOVERY | | |
| 28 | 15 | 24/16 | 28-30 | 10-22 27-34 | | Yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 28.6 feet to: Yellowish brown, SILT, some fine Sand, moist. Changing at 29.3 feet to: NO RECOVERY. | 28' SAND | | |
| 29 | | | | | | | 28.6' SILT | | |
| | | | | | | | 29.3' NO RECOVERY | | |
| 30 | 16 | 24/20 | 30-32 | 15-20 19-20 | | Brownish yellow, fine to medium SAND, trace Silt, moist. Changing at 30.3 feet to: Light yellowish brown, fine SAND, trace Silt, moist. Changing at 31.3 feet to: Brownish yellow, fine to medium SAND, trace Silt, moist. Changing at 31.7 feet to: NO RECOVERY. | 30' SAND | | |
| 31 | | | | | | | 31.7' NO RECOVERY | | |
| 32 | 17 | 24/20 | 32-34 | 11-14 17-20 | | Brownish yellow, fine to medium SAND, | 32' SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 3 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 33 | | | | | | trace Silt, moist. Changing at 33.2 feet to: Yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 33.5 feet to: Brownish yellow, fine to medium SAND, trace Silt, moist. Changing at 33.7 feet to: NO RECOVERY. | SAND | | |
| 34 | 18 | 24/23 | 34-36 | 13-17 20-24 | | Brownish yellow, fine SAND, trace Silt, moist. Changing at 35.9 feet to: NO RECOVERY. | 33.7' 34' NO RECOVERY SAND | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/20 | 36-38 | 9-18 22-27 | | Brownish yellow, fine SAND, trace Silt, moist. Changing at 36.7 to: Yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 36.8 feet to: Yellowish brown, SILT, moist. Changing at 37.7 feet to: NO RECOVERY. | 35.9' 36' NO RECOVERY SAND 36.8' SILT | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/22 | 38-40 | 10-10 14-15 | | Brownish yellow, fine SAND, trace Silt, moist. Changing at 38.5 feet to: Yellowish brown, fine SAND, some Silt, moist. Changing at 38.8 feet to: Yellowish brown, SILT, moist. Changing at 39.7 feet to: Yellowish brown, fine SAND, trace Silt, moist. Changing at 39.8 feet to: NO RECOVERY. | 37.7' 38' NO RECOVERY SAND 38.8' SILT | | |
| 39 | | | | | | | | | |
| 40 | 21 | 24/22 | 40-42 | 12-8 18-23 | | Dark yellowish brown, medium to coarse SAND, trace Silt, moist. Changing at 41.8 feet to: NO RECOVERY. | 39.7' 39.8' SAND 40' NO RECOVERY SAND | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/16 | 42-44 | 11-22 23-21 | | Dark yellowish brown, medium to coarse SAND, trace Silt, moist. Changing at 42.7 feet to: Yellowish brown, fine SAND, trace Silt, moist. Changing at 43.0 feet to: Yellowish brown, fine SAND, trace Silt, thin lenses of coarse SAND, moist. Changing at 43.3 feet to: NO RECOVERY. | 41.8' 42' NO RECOVERY SAND | | |
| 43 | | | | | | | 43.3' NO RECOVERY | | |
| 44 | 23 | 24/17 | 44-46 | 9-20 22-23 | | Yellowish brown, fine SAND, some Silt, moist. Changing at 45.4 feet to: NO RECOVERY. | 44' SAND | | |
| 45 | | | | | | | 45.4' NO RECOVERY | | |
| 46 | 24 | 24/16 | 46-48 | 11-19 20-25 | | Yellowish brown, fine to coarse SAND, trace Silt, moist. Changing at 46.9 feet to: Brownish yellow, fine SAND, trace Silt, moist. Changing at 47.3 feet to: NO RECOVERY. | 46' SAND | | |
| 47 | | | | | | | 47.3' NO RECOVERY | | |
| 48 | 25 | 18/18 | 48-49.5 | 11-18 20-18 | | Yellowish brown, fine to medium SAND, trace Gravel, trace Silt, moist. Changing at 48.9 feet to: Dark yellowish brown, coarse SAND, trace Silt, moist. Changing at 49.0 feet to: Yellowish brown, fine to medium SAND, trace Gravel, trace Silt, moist. | 48' SAND | | |
| 49 | | | | | | | 49.6' NO | | |
| | | | | | | | 50' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 4 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 26 | 24/16 | 50-52 | 11-12 12-11 | | Changing at 49.2 feet to: Dark yellowish brown, coarse SAND, trace Silt, moist. Changing at 49.3 feet to: Yellowish brown, fine to medium SAND, trace Gravel, trace Silt, moist. Changing at 49.6 feet to: NO RECOVERY. | RECOVERY SAND | | |
| 51 | | | | | | | 51.1' 51.3' SILT | | |
| | | | | | | | NO RECOVERY | | |
| 52 | 27 | 24/16 | 52-54 | 6-5 6-6 | | Yellowish brown, fine to medium SAND, trace Gravel, trace Silt, moist. Changing at 50.6 feet to: Yellowish brown, fine to medium SAND, trace Silt, moist. Changing at 51.1 feet to: Yellowish brown, SILT, moist. Changing at 51.3 feet to: NO RECOVERY. | 52' SAND | | |
| 53 | | | | | | | 53.3' | | |
| | | | | | | | NO RECOVERY | | |
| 54 | 28 | 24/7 | 54-56 | 3-4 8-15 | | Yellowish brown, fine SAND, trace Silt, wet. Changing at 52.6 feet to: Dark yellowish brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 53.3 feet to: NO RECOVERY. | 54' SAND 54.6' | | |
| 55 | | | | | | | NO RECOVERY | | |
| 56 | 29 | 24/17 | 56-58 | 6-10 10-14 | | Dark yellowish brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 54.6 feet to: NO RECOVERY. Dark yellowish brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 57.4 feet to: NO RECOVERY. | 56' SAND | | |
| 57 | | | | | | | 57.4' | | |
| | | | | | | | NO RECOVERY | | |
| 58 | 30 | 24/12 | 58-60 | 2-5 9-9 | | Dark yellowish brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 59.0 feet to: No RECOVERY. | 58' SAND | | |
| 59 | | | | | | | 59' NO RECOVERY | 1 | |
| 60 | 31 | 24/1 | 60-62 | 1-3 8-10 | | Yellowish brown, fine SAND, trace Silt, moist. Changing at 60.1 feet to: NO RECOVERY. | 60' 60.1' SAND NO RECOVERY | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/16 | 62-64 | 3-5 17-16 | | Dark yellowish brown, Silty CLAY, moist. Changing at 62.1 feet to: Dark yellowish brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 62.3 feet to: Dark yellowish brown, Silty CLAY, moist. Changing at 63.2 feet to: Dark yellowish brown to dark brown, coarse SAND, trace Silt, wet. Changing at 63.3 feet to: NO RECOVERY. | 62' Silty CLAY | 2 | |
| 63 | | | | | | | 63.2' 63.3' SAND | | |
| | | | | | | | NO RECOVERY | | |
| 64 | 33 | 24/14 | 64-66 | 2-6 10-13 | | | 64' SAND | | |
| 65 | | | | | | Dark yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 64.4 feet to: Dark yellowish brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 65.2 feet to: NO RECOVERY. | 65.2' | | |
| | | | | | | | NO RECOVERY | | |
| 66 | 34 | 24/11 | 66-68 | 4-10 10-12 | | Yellowish brown, fine to coarse SAND, some Gravel, trace Silt, wet. Changing at 66.9 feet to: NO RECOVERY. | 66' SAND | | |
| 67 | | | | | | | 66.9' NO RECOVERY | | |

**REMARKS**

1. Temporary well set at 59.0 to 64.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
2. Groundwater was encountered at approximately 62.1 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 5 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 68 | 35 | 24/19 | 68-70 | 14-16 13-14 | | Yellowish brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 68.2 feet to: Dark yellowish brown, coarse SAND, trace Silt, wet. Changing at 68.3 feet to: Yellowish brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 69.2 feet to: Dark yellowish brown, Silty CLAY, trace Gravel, moist. Changing at 69.3 feet to: Yellowish brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 69.6 feet to: NO RECOVERY. Dark yellowish brown, GRAVEL, some fine to coarse Sand, trace Silt, wet. Changing at 70.8 feet to: NO RECOVERY. Yellowish brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 72.7 feet to: NO RECOVERY. | 68' SAND 69.2' 69.3' Silty CLAY 69.6' SAND 70' NO RECOVERY GRAVEL 70.8' NO RECOVERY 72' SAND 72.7' NO RECOVERY | 3 | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/10 | 70-72 | 3-7 12-12 | | | | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/8 | 72-74 | 5-8 16-17 | | | | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/16 | 74-76 | 3-12 19-21 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 74.3 feet to: Brown, coarse SAND, some Gravel, trace Silt, wet. Changing at 74.6 feet to: Yellowish brown, SILT, wet. Changing at 75.3 feet to: NO RECOVERY. | 74' SAND 74.6' SILT 75.3' NO RECOVERY | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/19 | 76-78 | 14-16 22-26 | | Dark yellowish brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 76.7 feet to: Yellowish brown, SILT, trace fine Sand, trace Gravel, trace Clay, wet. Changing at 77.4 feet to: Brown to yellowish brown, fine SAND, trace Gravel, trace Silt, wet. Changing at 77.6 feet to: NO RECOVERY. Brown to yellowish brown, fine SAND, trace Gravel, trace Silt, wet. Changing at 78.5 feet to: NO RECOVERY. | 76' SAND 76.7' SILT 77.4' 77.6' SAND 78' NO RECOVERY 78.5' SAND NO RECOVERY | 4 | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/6 | 78-80 | 7-9 15-19 | | | | | |
| 79 | | | | | | | | | |
| 80 | 41 | 24/12 | 80-82 | 0-0 9-20 | | Dark yellowish brown, fine SAND, trace Gravel, trace Silt, wet. Changing at 81.0 feet to: NO RECOVERY. | 80' SAND 81' NO RECOVERY | | |
| 81 | | | | | | | | | |
| 82 | 42 | 24/18 | 82-84 | 2-8 16-22 | | Dark yellowish brown, fine SAND, trace Gravel, trace Silt, wet. Changing at 83.5 feet to: NO RECOVERY. | 82' SAND 83.5' NO RECOVERY | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/6 | 84-86 | 7-13 15-18 | | Dark yellowish brown, fine to coarse SAND, some Gravel, trace Silt, wet. Changing at 84.5 feet to: NO RECOVERY. | 84' SAND 84.5' NO RECOVERY | | |

**REMARKS**

3. Temporary well set at 69.0 to 74.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
4. Temporary well set at 79.0 to 84.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 6 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 86 | 44 | 24/7 | 86-88 | 5-10 19-28 | | Dark yellowish brown, fine to coarse SAND, some Gravel, trace Silt, wet. Changing at 86.6 feet to: NO RECOVERY. | NO RECOVERY; 86' SAND; 86.6' NO RECOVERY | | |
| 87 | | | | | | | | | |
| 88 | 45 | 24/19 | 88-90 | 11-20 30-45 | | Dark yellowish brown to yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 89.6 feet to: NO RECOVERY. | 88' SAND; 89.6' NO RECOVERY | 5 | |
| 89 | | | | | | | | | |
| 90 | 46 | 24/17 | 90-92 | 2-11 23-43 | | Dark yellowish brown to yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 91.4 feet to: NO RECOVERY. | 90' SAND; 91.4' NO RECOVERY | | |
| 91 | | | | | | | | | |
| 92 | 47 | 24/18 | 92-94 | 0-1 6-11 | | Dark yellowish brown to yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 93.5 feet to: NO RECOVERY. | 92' SAND; 93.5' NO RECOVERY | | |
| 93 | | | | | | | | | |
| 94 | 48 | 24/5 | 94-96 | 4-8 16-24 | | Dark yellowish brown to yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 94.4 feet to: NO RECOVERY. | 94' SAND; 94.4' NO RECOVERY | | |
| 95 | | | | | | | | | |
| 96 | 49 | 24/7 | 96-98 | 4-13 19-31 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 96.6 feet to: NO RECOVERY. | 96' SAND; 96.6' NO RECOVERY | | |
| 97 | | | | | | | | | |
| 98 | 50 | 24/8 | 98-100 | 2-7 15-22 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 98.7 feet to: NO RECOVERY. | 98' SAND; 98.7' NO RECOVERY | | Bentonite/Grout |
| 99 | | | | | | | | 6 | |
| 100 | 51 | 24/12 | 100-102 | 9-15 25-38 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 101.0 feet to: NO RECOVERY. | 100' SAND; 101' NO RECOVERY | | |
| 101 | | | | | | | | | |
| 102 | 52 | 24/0 | 102-104 | 7-24 39-50/4" | | NO RECOVERY. | | | |

**REMARKS**

5. Temporary well set at 89.0 to 94.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
6. Temporary well set at 99.0 to 104.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 7 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 103 | | | | | | | NO RECOVERY | | |
| 104 | 53 | 24/12 | 104-106 | 11-23 32-45 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 105.0 feet to: NO RECOVERY. | 104' SAND | | |
| 105 | | | | | | | 105' NO RECOVERY | | |
| 106 | 54 | 24/16 | 106-108 | 5-18 37-50/5" | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 107.3 feet to: NO RECOVERY. | 106' SAND | | |
| 107 | | | | | | | 107.3' NO RECOVERY | | |
| 108 | 55 | 24/12 | 108-110 | 4-18 48-50/3" | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 109.0 feet to: NO RECOVERY. | 108' SAND | | |
| 109 | | | | | | | 109' NO RECOVERY | 7 | |
| 110 | 56 | 24/2 | 110-112 | 10-22 36-50/5" | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 110.2 feet to: NO RECOVERY. | 110' 110.2' SAND NO RECOVERY | | |
| 111 | | | | | | | | | |
| 112 | 57 | 24/14 | 112-114 | 13-27 41-50 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 113.2 feet to: NO RECOVERY. | 112' SAND | | |
| 113 | | | | | | | 113.2' NO RECOVERY | | |
| 114 | 58 | 24/20 | 114-116 | 12-27 35-50 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 115.7 feet to: NO RECOVERY. | 114' SAND | | |
| 115 | | | | | | | 115.7' | | |
| 116 | 60 | 24/16 | 116-118 | 3-8 22-48 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 117.3 feet to: NO RECOVERY. | 116' NO RECOVERY SAND | | |
| 117 | | | | | | | 117.3' NO RECOVERY | | |
| 118 | 61 | 24/0 | 118-120 | 5-9 16-27 | | NO RECOVERY. | | | |
| 119 | | | | | | | | 8 | |

**REMARKS**

7. Temporary well set at 109.0 to 114.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
8. Temporary well set at 119.0 to 124.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-13C

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 8 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 62 | 24/0 | 120-122 | 5-10 25-32 | | NO RECOVERY. | NO RECOVERY | | |
| 121 | | | | | | | | | |
| 122 | 63 | 24/2 | 122-124 | 5-11 18-25 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 122.2 feet to: NO RECOVERY. | 122' 122.2' SAND NO RECOVERY | | |
| 123 | | | | | | | | | |
| 124 | 64 | 24/0 | 124-126 | 5-12 21-25 | | NO RECOVERY. | | | |
| 125 | | | | | | | | | |
| 126 | 65 | 24/5 | 126-128 | 4-9 19-27 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 126.4 feet to: NO RECOVERY. | 126' SAND 126.4' NO RECOVERY | | |
| 127 | | | | | | | | | |
| 128 | 66 | 24/12 | 128-130 | 15-23 40-47 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 129.0 feet to: NO RECOVERY. | 128' SAND 129' NO RECOVERY | 9 | |
| 129 | | | | | | | | | |
| 130 | 67 | 24/5 | 130-132 | 7-9 19-33 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 130.4 feet to: NO RECOVERY. | 130' SAND 130.4' NO RECOVERY | | |
| 131 | | | | | | | | | |
| 132 | 68 | 24/6 | 132-134 | 3-9 22-43 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 133.1 feet to: NO RECOVERY. | 132' SAND 133.1' NO RECOVERY | | |
| 133 | | | | | | | | | |
| 134 | 70 | 24/0 | 134-136 | 2-4 14-25 | | NO RECOVERY. | | | |
| 135 | | | | | | | | | |
| 136 | 71 | 24/13 | 136-138 | 8-25 36-45 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 137.1 feet to: NO RECOVERY. | 136' SAND 137.1' | | |
| 137 | | | | | | | | | |

**REMARKS**

9. Temporary well set at 129.0 to 134.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 9 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 138 | 72 | 24/13 | 138-140 | 6-5 7-11 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 139.1 feet to: NO RECOVERY. | NO RECOVERY 138' SAND 139.1' | 10 | |
| 139 | | | | | | | NO RECOVERY 140' | | |
| 140 | 73 | 24/13 | 140-142 | 1-4 9-17 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 141.1 feet to: NO RECOVERY. | SAND 141.1' | | |
| 141 | | | | | | | NO RECOVERY | | |
| 142 | 74 | 24/0 | 142-144 | 2-8 18-26 | | NO RECOVERY. | | | |
| 143 | | | | | | | 144' | | |
| 144 | 75 | 24/13 | 144-146 | 1-6 13-28 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 145.1 feet to: NO RECOVERY. | SAND 145.1' | | |
| 145 | | | | | | | NO RECOVERY 146' | | |
| 146 | 76 | 24/17 | 146-148 | 7-13 32-50 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 174.4 feet to: NO RECOVERY. | SAND 147.4' | | |
| 147 | | | | | | | NO RECOVERY 148' | | |
| 148 | 77 | 24/14 | 148-150 | 6-15 28-50 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 149.2 feet to: NO RECOVERY. | SAND 149.2' | 11 | |
| 149 | | | | | | | NO RECOVERY 150' | | |
| 150 | 78 | 24/7 | 150-152 | 6-15 25-44 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 150.6 feet to: NO RECOVERY. | SAND 150.6' | | |
| 151 | | | | | | | NO RECOVERY 152' | | |
| 152 | 79 | 24/11 | 152-154 | 14-28 63-50/4" | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 152.9 feet to: NO RECOVERY. | SAND 152.9' | | |
| 153 | | | | | | | NO RECOVERY 154' | | |
| 154 | 80 | 24/6 | 154-156 | 8-19 32-50 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 154.5 feet to: NO RECOVERY. | SAND 154.5' NO RECOVERY | | |

**REMARKS**

10. Temporary well set at 139.0 to 144.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
11. Temporary well set at 149.0 to 154.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 10 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 156 | 81 | 24/8 | 156-158 | 9-18 30-50/2" | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 156.7 feet to: NO RECOVERY. | NO RECOVERY; 156' SAND; 156.7' NO RECOVERY | | |
| 157 | | | | | | | | | |
| 158 | 82 | 24/2 | 158-160 | 3-12 25-37 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 158.2 feet to: NO RECOVERY. | 158' 158.2' SAND; NO RECOVERY | | |
| 159 | | | | | | | | 12 | |
| 160 | 83 | 18/5 | 160-161.5 | 15-13-27 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 160.4 feet to: NO RECOVERY. | 160' SAND; 160.4' NO RECOVERY | | |
| 161 | | | | | | | | | |
| 162 | 84 | 24/8 | 162-164 | 6-19 32-32 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 162.7 feet to: NO RECOVERY. | 162' SAND; 162.7' NO RECOVERY | | |
| 163 | | | | | | | | | |
| 164 | 85 | 24/16 | 164-166 | 3-12 28-46 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 165.3 feet to: NO RECOVERY. | 164' SAND; 165.3' NO RECOVERY | | |
| 165 | | | | | | | | | |
| 166 | 86 | 18/8 | 166-167.5 | 8-22-40 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 166.7 feet to: NO RECOVERY. | 166' SAND; 166.7' NO RECOVERY | | |
| 167 | | | | | | | | | |
| 168 | 87 | 24/10 | 168-170 | 5-19 25-42 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 168.8 feet to: NO RECOVERY. | 168' SAND; 168.8' NO RECOVERY | | |
| 169 | | | | | | | | 13 | |
| 170 | 88 | 24/20 | 170-172 | 33-30 32-34 | | Yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 171.3 feet to: Very dark brown, Silty CLAY, moist. Changing at 171.7 feet to: NO RECOVERY. | 170' SAND; 171.3' Silty CLAY | | |
| 171 | | | | | | | 171.6' SAND; 171.7' NO RECOVERY | | |
| 172 | 89 | 24/8 | 172-174 | 33-43 45-47 | | Brown, fine to coarse SAND, some Gravel, | 172' | | |

**REMARKS**

12. Temporary well set at 159.0 to 164.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
13. Temporary well set at 169.0 to 174.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 11 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 173 | | | | | | trace Silt, wet. Changing at 172.7 feet to: NO RECOVERY. | 172.7' SAND NO RECOVERY | | |
| 174 | 90 | 24/5 | 174-176 | 2-6 27-50/3" | | Brown, fine to coarse SAND, some Gravel, trace Silt, wet. Changing at 174.3 feet to: NO RECOVERY. | 174' 174.3' SAND NO RECOVERY | | |
| 175 | | | | | | | | | |
| 176 | 91 | 24/0 | 176-178 | 14-50/5" | | NO RECOVERY. | | | |
| 177 | | | | | | | | | |
| 178 | 92 | 18/4 | 178-179.5 | 6-31-50 | | Brown, fine to coarse SAND, some Gravel, trace Silt, wet. Changing at 178.3 feet to: NO RECOVERY. | 178' 178.3' SAND NO RECOVERY | | |
| 179 | | | | | | | | 14 | |
| 180 | 93 | 12/2 | 180-181 | 18-50 | | Brown, fine to coarse SAND, some Gravel, trace Silt, wet. Changing at 180.2 feet to: NO RECOVERY. | 180' 180.2' SAND NO RECOVERY | | |
| 181 | | | | | | | | | |
| 182 | 94 | 24/7 | 182-184 | 13-50/2" | | Dark grayish brown, CLAY, some Sand, little Silt, trace Gravel, moist. Changing at 182.6 feet to: NO RECOVERY. | 182' CLAY 182.6' NO RECOVERY | | |
| 183 | | | | | | | | | |
| 184 | 95 | 24/19 | 184-186 | 19-43 42-50/5" | | Dark yellowish brown, fine to medium SAND, trace Silt, wet. Changing at 184.7 feet to: Dark yellowish brown, fine to coarse SAND, little Gravel, trace Silt, wet. Changing at 184.9 feet to: Grayish brown, GRAVEL, some Sand, trace Silt, wet. Changing at 185.6 feet to: NO RECOVERY. | 184' SAND 184.9' GRAVEL 185.6' NO RECOVERY | | |
| 185 | | | | | | | | | |
| 186 | 96 | 12/6 | 186-187 | 23-50 | | Grayish-brown, GRAVEL, some Sand, trace Silt, wet. Changing at 186.5 feet to: NO RECOVERY. | 186' GRAVEL 186.5' NO RECOVERY | | |
| 187 | | | | | | | | | |
| 188 | 97 | 12/11 | 188-189 | 40-50/4" | | Dark yellowish brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 188.3 feet to: Brown to dark brown, medium to coarse SAND, trace Gravel, trace Silt, wet. Changing at 188.9 feet to: NO RECOVERY. | 188' SAND 188.9' NO RECOVERY 190' | | |
| 189 | | | | | | | | 15 | |

**REMARKS**

14. Temporary well set at 179.0 to 184.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
15. Temporary well set at 189.0 to 194.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

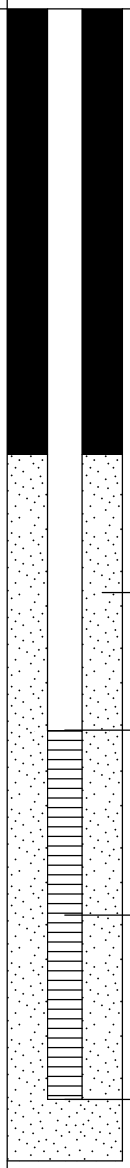
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-13C
**Page:** 12 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 98 | 12/10 | 190-191 | 26-50/3" | | Dark yellowish-brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 190.6 feet to: Brown, fine to medium SAND, trace Silt, wet. Changing at 190.8 feet to: NO RECOVERY. | SAND; 190.8' NO RECOVERY | |
| 191 | | | | | | | | |
| 192 | 99 | 12/12 | 192-193 | 25-50/3" | | Brown, fine to medium SAND, trace Silt, wet. Changing at 192.6 feet to: NO RECOVERY. | | |
| 193 | | | | | | | | |
| 194 | 100 | 12/7 | 194-195 | 29-50/2" | | Brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 194.6 feet to: Grayish-brown, SILT, little Clay, moist. Changing at 194.7 feet to: NO RECOVERY. | 194' SAND; 194.6' 194.7' SILT; NO RECOVERY | |
| 195 | | | | | | | | |
| 196 | 101 | 6/6 | 196-196.5 | 50/3" | | Brown, fine to medium SAND, trace Silt, wet. Changing at 196.6 feet to: NO RECOVERY. | 196' SAND; 196.6' NO RECOVERY | |
| 197 | | | | | | | | |
| 198 | 102 | 12/7 | 198-199 | 30-50/3" | | Yellowish-brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 198.6 feet to: NO RECOVERY. | 198' SAND; 198.6' NO RECOVERY | |
| 199 | | | | | | | | |
| 200 | 103 | 18/17 | 200-201.5 | 37-33-50/2" | | Yellowish-brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 201.2 feet to: NO RECOVERY. | 200' SAND; 201.2' NO RECOVERY | |
| 201 | | | | | | | | |
| 202 | 104 | 12/11 | 202-203 | 37-50/2" | | Yellowish-brown, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 202.1 feet to: Grayish-brown, GRAVEL, some coarse Sand, trace Silt, wet. Changing at 202.2 feet to: Brown, SILT, some fine Sand, wet. Changing at 202.3 feet to: Grayish-brown, GRAVEL, some coarse Sand, trace Silt, wet. Changing at 202.5 feet to: Brown, fine SAND, some Silt, moist. Changing at 202.7 feet to: Brown, Silty CLAY, trace Gravel, moist. Dark grayish-brown, Silty CLAY, trace Gravel, moist. Changing at 204.9 feet to: NO RECOVERY. | 202' 202.1' SAND; 202.2' GRAVEL; 202.3' SILT; 202.5' GRAVEL; 202.7' SAND; Silty CLAY | |
| 203 | | | | | | | | |
| 204 | 105 | 12/11 | 204-205 | 37-50/2" | | | 204.9' 205' NO RECOVERY | 16 |
| 205 | | | | | | Bottom of Borehole at 205.0 Feet | | |
| 206 | | | | | | | | |
| 207 | | | | | | | | |

**Equipment Installed**




**REMARKS**

16. Monitoring well was installed in borehole upon completion. Well screen set from 199.4 to 204.2 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-14D
**Page:** 1 **of** 4
**File No.:** 16.0062335.52
**Check:** John Morehouse

**Contractor:** Stearns Drilling Company
**Foreman:** Bert Graham
**Logged by:** Christopher Melby
**Date Start/Finish:** 3-15-18 / 3-15-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

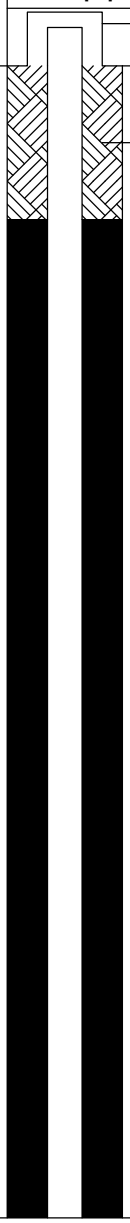
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/24 | 0-2 | 11-5<br>9-10 | | Black, TOPSOIL. Changing at 0.3 feet to: Medium brown, fine SAND, trace, Silt. | SAND | |
| 8 | 2 | 24/24 | 8-10 | 2-2<br>2-1 | | Loose, brown, fine to medium SAND, trace Silt. | | |
| 15 | | | | | | | | 1 |
| 18 | 3 | 24/12 | 18-20 | 2-3<br>5-3 | | Loose, brown and gray, coarse SAND, trace Gravel, wet. | | |
| 23 | 4 | 24/12 | 23-25 | 3-1<br>1-2 | | Very loose, brown and gray, fine to coarse SAND, wet. | | |
| 28 | 5 | 24/16 | 28-30 | 2-4<br>4-5 | | Loose, brown, fine to medium SAND, trace Silt. Changing at 29.0 feet to: Brown, Clayey SILT, little fine Sand, wet. | 29'<br>Clayey SAND | |

**Equipment Installed**




**REMARKS**

1. Groundwater encountered at approximately 14.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-14D

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 3/1/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-14D
**Page:** 2 **of** 4
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clayey SAND | | |
| 31–34 | 6 | 24/20 | 33-35 | 2-2<br>5-5 | | Medium stiff, Clayey SILT, little to trace fine to medium Sand, wet. | | | |
| 38–39 | 7 | 24/10 | 38-40 | 1-1<br>1-1 | | Loose, gray, fine SAND, little Clayey Silt, wet. | 38'<br>SAND | | |
| 43–44 | 8 | 24/16 | 43-45 | 4-4<br>5-7 | | Loose, gray, fine to medium SAND, little Silt, wet. | | | |
| 48–49 | 9 | 24/14 | 48-50 | 3-7<br>8-7 | | Medium dense, gray, fine to medium SAND, little Silt, wet. | | | |
| 53–54 | 10 | 24/24 | 53-55 | 2-3<br>3-5 | | Gray, fine to medium SAND, little Silt, wet. Changing at 53.5 feet to: Gray, Clayey SILT, some fine Sand, wet. | 53.5'<br>Clayey SILT | | Grout |
| 58–59 | 11 | 24/14 | 58-60 | 1-1<br>1-1 | | Soft, gray, Clayey SILT, little fine Sand, wet. | | | |
| 63–64 | 12 | 24/24 | 63-65 | 3-12<br>23-24 | | Hard, gray and brown, Clayey SILT, some fine to coarse Sand, wet. | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-14D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-14D
**Page:** 3 **of** 4
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 66 | | | | | | | Clayey SILT | | |
| 67 | | | | | | | | | |
| 68 | 13 | 24/24 | 68-70 | 5-13<br>17-18 | | Fine to medium SAND, trace Silt, wet. Changing at 69.2 feet to: Fine to coarse SAND, trace Gravel, trace Silt, wet. | 68'<br>SAND | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | 14 | 24/20 | 73-75 | 31-19<br>24-30 | | Hard, gray and brown, Clayey SILT, some fine to medium Sand, wet. Changing at 74.5 feet to: Gray and brown, fine to medium SAND, little Silt, wet. | 73'<br>Clayey SILT<br>74.5'<br>SAND | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | 15 | 24/24 | 78-80 | 4-8<br>20-53 | | Medium dense, brown and gray, fine to medium SAND, trace Silt, wet. | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | 16 | 24/18 | 83-85 | 2-4<br>8-26 | | Medium dense, brown and gray, fine to medium SAND, trace Silt, wet. | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | 17 | 24/24 | 88-90 | 3-7<br>13-34 | | Medium dense, brown and gray, fine to coarse SAND, trace Silt, wet. | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | 18 | 24/24 | 93-95 | 4-10<br>18-25 | | Medium dense, fine to medium SAND, trace Silt, wet. | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | 19 | 24/24 | 98-100 | 4-6<br>10-12 | | Medium dense, brown, fine to medium SAND, trace Silt, wet. | | | |
| 99 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 3/1/19

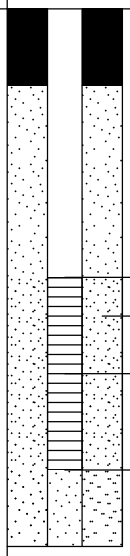
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-14D
**Page:** 4 **of** 4
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | |
| 101 | | | | | | | | |
| 102 | | | | | | | | |
| 103 | 20 | 24/24 | 103-105 | 19-12<br>19-25 | | Dense, fine to coarse SAND, little to trace Silt, wet. | | |
| 104 | | | | | | | | |
| 105 | | | | | | | | |
| 106 | | | | | | | | |
| 107 | | | | | | | | |
| 108 | 21 | 24/20 | 108-110 | 5-7<br>25-30 | | Dense, brown and gray, medium to coarse SAND, trace Silt, wet. | | |
| 109 | | | | | | | | |
| 110 | | | | | | | | |
| 111 | | | | | | | | |
| 112 | | | | | | | | |
| 113 | 22 | 4/6 | 113-113.3 | 12-75/3" | | Hard, brown and gray, CLAY & SILT, some medium to coarse Sand embedded in Clay, wet. | 113'<br>CLAY & SILT<br>114' | 2 |
| 114 | | | | | | Bottom of Borehole at 114.0 Feet | | |
| 115 | | | | | | | | |
| 116 | | | | | | | | |
| 117 | | | | | | | | |
| 118 | | | | | | | | |
| 119 | | | | | | | | |
| 120 | | | | | | | | |
| 121 | | | | | | | | |
| 122 | | | | | | | | |
| 123 | | | | | | | | |
| 124 | | | | | | | | |
| 125 | | | | | | | | |
| 126 | | | | | | | | |
| 127 | | | | | | | | |
| 128 | | | | | | | | |
| 129 | | | | | | | | |
| 130 | | | | | | | | |
| 131 | | | | | | | | |
| 132 | | | | | | | | |
| 133 | | | | | | | | |
| 134 | | | | | | | | |

**Equipment Installed**




**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from approximately 107.0 to 112.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-14D

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 3/1/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-14M
**Page:** 1 **of** 3
**File No.:** 16.0062335.52
**Check:** John Morehouse

**Contractor:** Stearns Drilling Company
**Foreman:** Bert Graham
**Logged by:** Christopher Melby
**Date Start/Finish:** 3-15-18 / 3-15-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

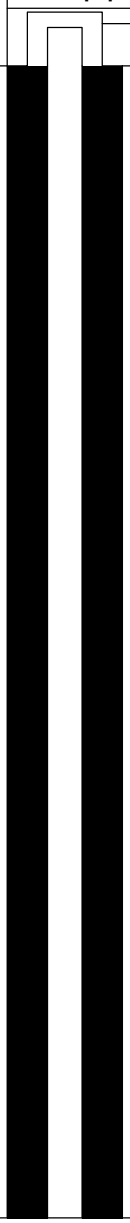
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See PMW-14D boring log for detailed soil descriptions for the first 48.0 feet.. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 3/1/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-14M
**Page:** 2 **of** 3
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | Grout |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | 1 | 24/12 | 48-50 | 2-2<br>3-2 | | Loose, brown and gray, fine to medium SAND, trace Silt, wet. | SAND | | |
| 49 | | | | | | | | | |
| 50 | 2 | 24/24 | 50-52 | 1-2<br>1-2 | | Very loose, brown and gray, fine to medium SAND, trace Silt, wet. | | | |
| 51 | | | | | | | | | |
| 52 | 3 | 24/24 | 52-54 | 2-2<br>3-5 | | Medium stiff, gray and brown, Clayey SILT, some fine to medium Sand, wet. | 52.5'<br>Clayey SILT | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 3/1/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-14M
**Page:** 3 **of** 3
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 66 | | | | | | | Clayey SILT | | |
| 67 | | | | | | | | | |
| 68 | 4 | 24/20 | 68-70 | 7-8<br>10-12 | | Medium dense, gray and brown, fine to coarse SAND, some Silt, wet. | 68' Silty SAND | | Top of Well Screen<br>Silica Sand Filter Pack |
| 69 | | | | | | | | | |
| 70 | 5 | 24/24 | 70-72 | 2-2<br>6-15 | | Loose, gray and brown, fine to medium SAND, little Silt, wet. | | | 2-Inch Dia. 10-Foot PVC Screen (0.010" Slot) |
| 71 | | | | | | | | | |
| 72 | 6 | 24/18 | 72-74 | 9-12<br>25-35 | | Brown and gray, fine to medium SAND, some Silt, wet. Changing at 73.0 feet to: Brown and gray, Clayey SILT, some medium to coarse Sand, embedded in Clayey Silt, wet. | | | |
| 73 | | | | | | | 73' Clayey SILT | | Bottom of Well Screen |
| 74 | | | | | | Bottom of Borehole at 74.0 Feet | 74' | 1 | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from approximately 68.0 to 73.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-14M

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-14S
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** John Morehouse

**Contractor:** Stearns Drilling Company
**Foreman:** Bert Graham
**Logged by:** Christopher Melby
**Date Start/Finish:** 3-15-18 / 3-15-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

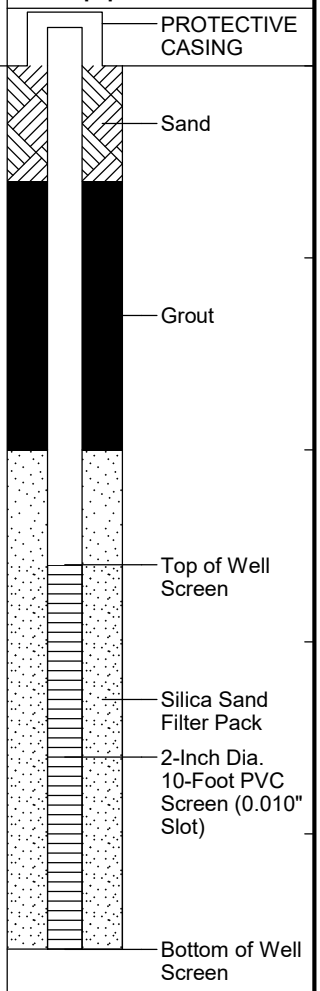
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–22 | | | | | | See PMW-14D boring log for detailed soil descriptions. | | |
| 23 | | | | | | Bottom of Borehole at 23.0 Feet | | 1 |
| 24–29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from approximately 13.0 to 23.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-14S

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 3/1/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-15D
**Page:** 1 **of** 4
**File No.:** 16.0062335.52
**Check:**

**Contractor:** Cascade Drilling
**Foreman:** Jason
**Logged by:** Ken Oanes
**Date Start/Finish:** 12-19-18 / 12-21-17
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | NA | NA |

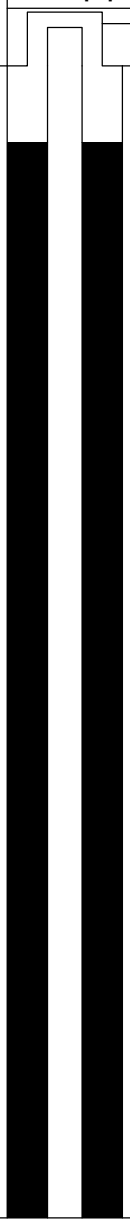
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 60/60 | 0-5 | | 0.4 ppm | Loose, dark brown, Silty SAND with Organics (plant roots), moist (SM). Changing at 1.4 feet to: Loose, light brown, poorly graded, fine to medium SAND and GRAVEL, with Lithics, moist (SP). | SAND (SM) | 1 |
| 2 | | | | | 0.3 ppm | | 1.4' SAND (SW) | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | 2 | 60/42 | 5-10 | | 0.2 ppm | Loose, light brown, well graded, fine to medium SAND with GRAVEL, sub-angular to sub-rounded, moist (SW). Changing at 7.5 feet to: Loose, light brown, well graded, SAND with coarse GRAVEL, sub-rounded, moist (SW). | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | 0.3 ppm | | | |
| 9 | | | | | | | | |
| 10 | 3 | 60/60 | 10-15 | | 0.4 ppm | Loose, light brown, Silty SAND with Gravel, wet (SM). Changing at 11.7 feet to: Loose, light brown, well graded, medium to coarse SAND and GRAVEL, sub-angular to sub-rounded, moist (SW). | 10' SAND (SM) | 2 |
| 11 | | | | | | | 11.7' SAND (SW) | |
| 12 | | | | | | | | |
| 13 | | | | | 0.4 ppm | | | |
| 14 | | | | | | | | |
| 15 | 4 | 60/60 | 15-20 | | 0.4 ppm | Loose, light brown, poorly graded, medium SAND, some Lithics, trace Gravel, moist (SP). | 15' SAND (SP) | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | 0.5 ppm | | | |
| 19 | | | | | | | | |
| 20 | 5 | 60/60 | 20-25 | | 0.5 ppm | Loose, light brown, poorly graded, medium SAND, some Lithics, trace Gravel, moist (SP). | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | 0.3 ppm | | | |
| 24 | | | | | | | | |
| 25 | 6 | 60/60 | 25-30 | | 0.3 ppm | Loose, tan, poorly graded, medium to coarse SAND, with lithics, sub-angular, moist (SP). | | 3 |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | 0.1 ppm | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.
2. Groundwater was encountered at approximately 10.0 feet below ground surface.
3. Temporary well set at 25.0 to 30.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-15D
**Page:** 2 **of** 4
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | 7 | 60/60 | 30-35 | | | Loose, tan, poorly graded, medium to coarse SAND, with lithics, sub-angular, moist (SP). | SAND (SP) | | |
| 32 | | | | | | | | | |
| 33 | | | | | 0.4 ppm | | | | |
| 34 | | | | | | | | | |
| 35 | 8 | 60/60 | 35-40 | | 0.3 ppm | Loose, brown, Silty fine SAND, sub-rounded, wet (SM). Changing at 35.5 feet to: Loose, brown, well graded, medium to coarse SAND and GRAVEL, sub-rounded to sub-angular, wet (SW). Changing at 37.5 feet: Loose, brown, well graded, coarse SAND, some fine to coarse Gravel, with Clay layers, wet (SW). | 35' 35.5' SAND (SM) SAND (SW) | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | 0.5 ppm | | | | |
| 39 | | | | | | | | | |
| 40 | 9 | 60/60 | 40-45 | | 0.5 ppm | Loose, brown, well graded, fine to coarse SAND with fine GRAVEL, sub-angular, wet (SW). Changing at 43.3 feet to: Loose, light brown, poorly graded, medium SAND, some lithics, sub-angular, wet (SP). | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | 0.5 ppm | | 43.3' SAND (SP) | | |
| 44 | | | | | | | | | |
| 45 | 10 | 60/60 | 45-50 | | 0.3 ppm | Loose, brown, well graded, medium SAND with Gravel, with layers of Silt and Cobbles, wet (SW). | 45' SAND (SW) | 4 | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | 0.3 ppm | | | | |
| 49 | | | | | | | | | |
| 50 | 11 | 60/60 | 50-55 | | | Loose, coarse GRAVEL and COBBLES up to 6.0 inch diameter, wet (GP). Changing at 51.0 feet to: Stiff, dark brown, SILT, little fine to coarse Gravel, rounded, moist (ML). | 50' GRAVEL/COBBLES (GP) 51' SILT (ML) | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | 2.1 ppm | | | | Grout |
| 54 | | | | | | | | | |
| 55 | 12 | 60/60 | 55-60 | | 3.7 ppm | Stiff, dark brown, SILT, little fine to coarse Gravel, rounded, moist (ML). | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | 2.7 ppm | | | | |
| 59 | | | | | | | | | |
| 60 | 13 | 60/60 | 60-65 | | 1.6 ppm | Stiff, dark brown, SILT, little fine to coarse Gravel, rounded, moist (ML). | | 5 | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | 2.7 ppm | | | | |
| 64 | | | | | | | 65' | | |

**REMARKS**

4. Temporary well set at 45.0 to 50.0 feet below ground surface. Heaving sands pushed casing to 47.5 feet only exposing lower 2.0 feet of well screen. Left overnight to purge after pumping dry.
5. Insufficient groundwater yield. No temporary well or sample.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-15D
**Page:** 3 **of** 4
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 60/60 | 65-70 | | 1.4 ppm | Stiff, dark gray, Silty fine SAND, trace fine Gravel, moist (SM). | Silty SAND (SM) | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | 0.7 ppm | | | | |
| 69 | | | | | | | | | |
| 70 | 15 | 60/60 | 70-75 | | 1.5 ppm | Stiff, dark gray, Silty fine SAND, moist (SM). | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | 1.2 ppm | | | | |
| 74 | | | | | | | | | |
| 75 | 16 | 60/60 | 75-80 | | 1.2 ppm | Stiff, dark gray, Silty fine SAND, moist (SM). | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | 1.4 ppm | | | | |
| 79 | | | | | | | | | |
| 80 | 17 | 60/60 | 80-85 | | 0.7 ppm | Stiff, dark gray, Silty fine SAND, moist (SM). | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | 0.5 ppm | | | | |
| 84 | | | | | | | | | |
| 85 | 18 | 60/60 | 85-90 | | 0.1 ppm | Very stiff, dark gray, Silty fine SAND, trace medium to coarse Sand, trace coarse Gravel, moist (SM). | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | 0.1 ppm | | | | |
| 89 | | | | | | | | | |
| 90 | 19 | 60/60 | 90-95 | | 0.7 ppm | Stiff, dark gray, SILT, trace Sand, moist (ML). Changing at 92.5 feet to: Stiff, dark gray, SILT transitioning to lean CLAY, moist (CL). | 90' SILT (ML) | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | 92.5' Lean CLAY (CL) | | |
| 93 | | | | | 0.9 ppm | | | | |
| 94 | | | | | | | | | |
| 95 | 20 | 60/60 | 95-100 | | 1.3 ppm | Stiff, dark gray, lean CLAY, trace fine Gravel, sub-rounded, moist (CL). | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | 1.1 ppm | | | | |
| 99 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-15D

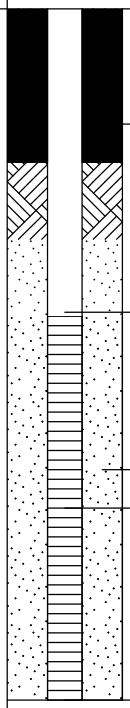
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-15D
**Page:** 4 **of** 4
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 101 | 21 | 60/60 | 100-105 | | 0.2 ppm | Stiff, dark gray, lean CLAY, trace fine Gravel, sub-rounded, moist (CL). Changing at 104.0 feet to: Stiff, dark gray, SILT, wet (ML). | Lean CLAY (CL) | |
| 102 | | | | | | | | |
| 103 | | | | | 0.3 pm | | | |
| 104 | | | | | | | 104' SILT (ML) | |
| 105 | 22 | 60/60 | 105-110 | | 1.0 ppm | Stiff, SILT with Gravel, small lenses (3-8mm) of white chystaline mineral, dry (ML). Changing at 107 feet to: Loose, dark brown, SILT with coarse Gravel, sub-rounded, wet (ML). | | |
| 106 | | | | | | | | |
| 107 | | | | | | | | |
| 108 | | | | | 0.8 ppm | | | |
| 109 | | | | | | | | |
| 110 | 23 | 60/60 | 110-115 | | 112.5 ppm | Loose, SILT with coarse Gravel and Cobbles, sub-rounded, small lenses of white crystalline mineral, wet (ML). | | 6 |
| 111 | | | | | | | | |
| 112 | | | | | | | | |
| 113 | | | | | | | | |
| 114 | | | | | | | | |
| 115 | 24 | 24/24 | 115-117 | | 0.5 ppm | Loose, SILT with GRAVEL and COBBLES, sub-rounded, small lenses of white crystalline mineral, wet (ML). | | |
| 116 | | | | | | | | |
| 117 | | | | | | Bottom of Borehole at 117.0 Feet | 117' | 7 |
| 118 | | | | | | | | |
| 119 | | | | | | | | |
| 120 | | | | | | | | |
| 121 | | | | | | | | |
| 122 | | | | | | | | |
| 123 | | | | | | | | |
| 124 | | | | | | | | |
| 125 | | | | | | | | |
| 126 | | | | | | | | |
| 127 | | | | | | | | |
| 128 | | | | | | | | |
| 129 | | | | | | | | |
| 130 | | | | | | | | |
| 131 | | | | | | | | |
| 132 | | | | | | | | |
| 133 | | | | | | | | |
| 134 | | | | | | | | |

**Equipment Installed**




**REMARKS**

6. Temporary well set at 110.0 to 115.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
7. Monitoring well was installed in borehole upon completion. Well screen set from 108.0 to 118.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-15D

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-15M
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:**

**Contractor:** Cascade Drilling
**Foreman:** Jason
**Logged by:** John Morehouse
**Date Start/Finish:** 1-17-18 / 1-17-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | NA | NA |

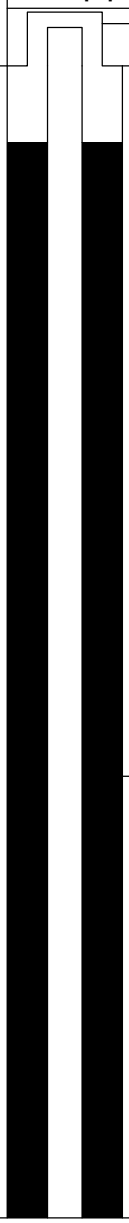
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-15D boring log for sample description and classification. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-15M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-15M
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | Bentonite Seal |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | Top of Well Screen |
| 46 | | | | | | | | | Silica Sand Filter Pack |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 49 | | | | | | | | | |
| 50 | | | | | | Bottom of Borehole at 50.0 Feet | | 1 | Bottom of Well Screen |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 45.0 to 50.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-15M

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-15S
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:**

**Contractor:** Cascade Drilling
**Foreman:** Jason
**Logged by:** John Morehouse
**Date Start/Finish:** 1-17-18 / 1-17-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | NA | NA |

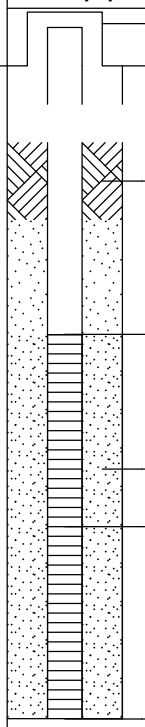
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–16 | | | | | | See MW-15D boring log for sample description and classification. | | |
| 17–29 | | | | | | Bottom of Borehole at 17.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 7.0 to 17.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-15S

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 1 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Christopher Melby / John Morehouse
**Date Start/Finish:** 1-29-18 / 2-26-18
**Boring Location:** 583,275.2942 N; 12,789,270.2772 E
**GS Elev.:** 784.6' **Datum:**

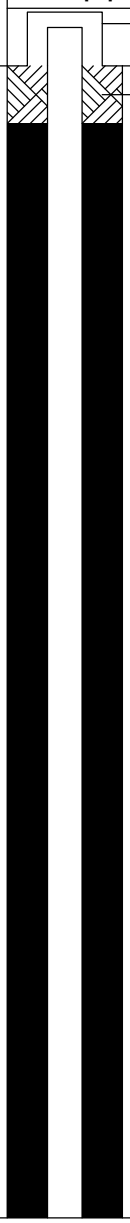
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" |
| **Hammer Wt.:** | 140lbs | 1 3/8" |
| **Hammer Fall:** | 30.0" | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/24 | 0-2 | 2-3 2-3 | | Dark brown, decaying LEAVES (FILL). Changing at 0.3 feet to: Very dark brown, well sorted, fine grained SAND, some Silt, some decaying Vegetation, moist (SM). Changing at 0.5 feet to: Dark yellowish brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, grading coarser, moist (SP). | | |
| 1 | | | | | | | | |
| 2 | 2 | 24/24 | 2-4 | 2-2 2-3 | | | | |
| 3 | | | | | | | | |
| 4 | 3 | 24/24 | 4-6 | 2-2 3-3 | | Dark yellowish brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, grading coarser, moist (SP). Dark yellowish brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, grading coarser, moist (SP). Changing at 4.5 feet to: Pale brown, very well sorted, fine grained SAND, trace Silt, moist (SP). Changing at 4.6 feet to: Yellowish brown, very well sorted, SILT, little fine grained Sand, slightly cohesive, non-plastic, moist (ML). Changing at 4.7 feet to: Pale brown, very well sorted, fine grained SAND, trace Silt, moist (SP). Changing at 4.8 feet to: Yellowish brown, very well sorted, SILT, little fine grained Sand, slightly cohesive, non-plastic, moist (ML). Changing at 4.9 feet to: Pale brown, very well sorted, fine grained, SAND, trace Silt, moist (SP). Changing at 5.0 feet to: Yellowish brown, very well sorted, SILT, little fine grained Sand, slightly cohesive, non-plastic, moist. Changing at 5.1 feet to: Pale brown, very well sorted, fine grained SAND, trace Silt, moist (SP). Changing at 5.2 feet to: Yellowish brown, very well sorted, SILT, little fine grained Sand, slightly cohesive, non-plastic, moist (ML). Light yellowish brown to pale brown, poorly sorted, fine to coarse grained SAND, little Gravel, trace Silt, moist (SW). Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). Changing at 9.1 feet to: Dark yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). Changing at 12.3 feet to: Pale brown, | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/24 | 6-8 | 3-5 8-9 | | | | |
| 7 | | | | | | | | |
| 8 | 5 | 24/24 | 8-10 | 5-5 5-5 | | | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/24 | 10-12 | 3-4 4-4 | | | | |
| 11 | | | | | | | | |
| 12 | 7 | 24/24 | 12-14 | 5-10 9-6 | | | | |
| 13 | | | | | | | | |
| 14 | 8 | 24/24 | 14-16 | 3-4 4-4 | | | | |
| 15 | | | | | | | | |
| 16 | 9 | 24/24 | 16-18 | 3-3 4-4 | | | | |
| 17 | | | | | | | | |
| 18 | 10 | 24/24 | 18-20 | 3-3 3-4 | | | | |
| 19 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 2 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 11 | 24/24 | 20-22 | 3-3<br>4-5 | | poorly sorted, medium to coarse grained SAND, little Gravel, trace Silt, moist (SW). | | | |
| 21 | | | | | | Light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 22 | 12 | 24/24 | 22-24 | 3-6<br>8-8 | | Light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 23 | | | | | | Light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 24 | 13 | 24/24 | 24-26 | 6-10<br>11-11 | | Light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 25 | | | | | | Light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 26 | 14 | 24/24 | 26-28 | 5-10<br>12-16 | | Light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). Changing at 22.8 feet to: Brown, poorly sorted, GRAVEL, trace coarse grained Sand, moist (GP). Changing at 22.9 feet to: Light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, moist (SP). Changing at 23.4 feet to: Brown, very poorly sorted, GRAVEL, trace coarse grained Sand, moist (GP). | | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/24 | 28-30 | 5-12<br>14-20 | | | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/24 | 30-32 | 15-12<br>14-20 | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 31 | | | | | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 32 | 17 | 24/24 | 32-34 | 5-7<br>8-8 | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 33 | | | | | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist (SP). | | | |
| 34 | 18 | 24/24 | 34-36 | 7-8<br>10-11 | | Light yellowish brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/24 | 36-38 | 7-10<br>9-14 | | Light yellowish brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | | |
| 37 | | | | | | Light yellowish brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | | |
| 38 | 20 | 24/24 | 38-40 | 10-10<br>12-12 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, moist (SP). Changing at 39.5 feet to: Brown to yellowish brown, very well sorted, SILT, some fine grained Sand, slightly cohesive, moist (ML). | | | |
| 39 | | | | | | | | | |
| 40 | 21 | 24/24 | 40-42 | 11-11<br>11-10 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). | | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/24 | 42-44 | 6-6<br>7-9 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). | | | |
| 43 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 3 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 44–45 | 23 | 24/24 | 44-46 | 6-6 8-9 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). | | | |
| 46–47 | 24 | 24/24 | 46-48 | 7-9 10-10 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). | | | |
| 48–49 | 25 | 24/24 | 48-50 | 7-4 9-9 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). | | | |
| 50–51 | 26 | 24/24 | 50-52 | 5-6 8-10 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). | | | |
| 52–53 | 27 | 24/24 | 52-54 | 6-8 13-18 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). | | | |
| 54–55 | 28 | 24/24 | 54-56 | 9-12 13-17 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). | | | |
| 56–57 | 29 | 24/24 | 56-58 | 10-14 25-22 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). Changing at 57.6 feet to: Brown to yellowish brown, very well sorted, SILT, some fine grained Sand, slightly cohesive, non-plastic, moist to wet (ML). | | | |
| 58–59 | 30 | 24/24 | 58-60 | 17-21 31-32 | | Pale to very pale brown, very well sorted, fine grained SAND, trace Silt, bedded, moist (SP). Changing at 59.0 feet to: Very dark grayish brown, well sorted, fine grained SAND, trace Silt, moist (SP). Changing at 59.1 feet to: Pale brown, very sell sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). | | | |
| 60–61 | 31 | 24/24 | 60-62 | 13-22 27-27 | | Pale brown, very sell sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). | | | |
| 62–63 | 32 | 24/24 | 62-64 | 12-21 25-33 | | Pale brown, very sell sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). | | | |
| 64–65 | 33 | 24/24 | 64-66 | 2-6 9-13 | | Pale brown, very sell sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). | | | |
| 66 | 34 | 24/24 | 66-68 | 3-10 | | Pale brown, very sell sorted, fine to medium | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 4 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 67 | | | | 11-18 | | grained SAND, some Silt, bedded, moist (SM). | | | |
| 68 | 35 | 24/24 | 68-70 | 7-17<br>21-23 | | Pale brown, very sell sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). Changing at 68.3 feet to: Dark yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist (SP). | | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/24 | 70-72 | 5-14<br>22-28 | | Changing at 68.4 feet to: Pale brown, very well sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). | | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/24 | 72-74 | 8-20<br>22-35 | | Pale brown, very well sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). | | | |
| 73 | | | | | | Pale brown, very well sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). | | | |
| 74 | 38 | 24/24 | 74-76 | 5-16<br>28-41 | | Pale brown, very well sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). | | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/24 | 76-78 | 9-21<br>29-44 | | Pale brown, very well sorted, fine to medium grained SAND, some Silt, bedded, moist (SM). Changing at 76.8 feet to: Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/24 | 78-80 | 2-10<br>22-24 | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 79 | | | | | | | | | |
| 80 | 41 | 24/24 | 80-82 | 2-8<br>14-24 | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 81 | | | | | | | | | |
| 82 | 42 | 24/24 | 82-84 | 1-3<br>6-12 | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/24 | 84-86 | 1-1<br>3-8 | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/24 | 86-88 | 1-2<br>5-12 | | Light yellowish brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). Changing at 87.6 feet to: Brown, moderately sorted, coarse grained SAND, some Gravel, wet (SW). | | | |
| 87 | | | | | | | | | |
| 88 | 45 | 24/24 | 88-90 | 1-2<br>9-14 | | Yellowish brown to brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, wet (SP). | | | |
| 89 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 5 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 91 | 46 | 24/24 | 90-92 | 1-2<br>3-5 | | Yellowish brown to brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, wet (SP). | | | |
| 92<br>93 | 47 | 24/24 | 92-94 | 1-2<br>4-11 | | Yellowish brown to brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, wet (SP). | | | |
| 94<br>95 | 48 | 24/24 | 94-96 | 1-3<br>5-9 | | Yellowish brown to brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, wet (SP). | | | |
| 96<br>97 | 49 | 24/24 | 96-98 | 1-4<br>6-12 | | Yellowish brown to brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, wet (SP). | | | |
| 98<br>99 | 50 | 24/24 | 98-100 | 3-4<br>8-15 | | Yellowish brown to brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, wet (SP). | | | |
| 100<br>101 | 51 | 24/24 | 100-102 | 2-2<br>3-10 | | Yellowish brown to brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, wet (SP). | | | |
| 102<br>103 | 52 | 24/24 | 102-104 | 2-7<br>14-21 | | Yellowish brown to brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, wet (SP). Changing at 103.2 feet to: Brown to yellowish brown, very well sorted, SILT, some fine grained Sand, slightly cohesive, wet (ML). Changing at 103.5 feet to: Brown to yellowish brown, well sorted SILT, some fine grained Sand, trace Clay, moderately cohesive, non to slightly plastic, bedded, moist to wet (ML). Changing at 103.6 feet to: Brown to yellowish brown, very well sorted, SILT, some fine grained Sand, slightly cohesive, wet (ML). Yellowish brown to brown, very well sorted, fine grained SAND, trace Silt, wet (SP). Yellowish brown to brown, very well sorted, fine grained SAND, trace Silt, wet (SP). Yellowish brown to brown, very well sorted, fine grained SAND, trace Silt, wet (SP). Changing at 108.9 feet to: Yellowish brown to brown, well sorted, SILT, some fine grained Sand, wet (ML). Changing at 109.0 feet to: Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Changing at 109.5 feet to: Dark yellowish brown, well sorted, fine to medium SAND, trace Silt, wet (SP). Changing at 109.7 feet to: Yellowish brown | | | |
| 104<br>105 | 53 | 24/24 | 104-106 | 2-2<br>3-6 | | | | | |
| 106<br>107 | 54 | 24/24 | 106-108 | 1-1<br>3-5 | | | | | Bentonite/Grout |
| 108<br>109 | 55 | 24/24 | 108-110 | 3-4<br>8-12 | | | | | |
| 110<br>111 | 56 | 24/24 | 110-112 | 1-1<br>3-7 | | | | | |
| 112<br>113 | 57 | 24/24 | 112-114 | 1-3<br>5-8 | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 6 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 114 | 58 | 24/24 | 114-116 | 1-4 12-18 | | to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 115 | | | | | | | | | |
| 116 | 59 | 24/24 | 116-118 | 1-5 12-22 | | Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). | | | |
| 117 | | | | | | | | | |
| 118 | 60 | 24/24 | 118-120 | 1-1 1-4 | | Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Changing at 116.2 feet to: Dark yellowish brown, well sorted, Silty CLAY, plastic, cohesive, moist (CL). Changing at 116.3 feet: Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Changing at 116.8 feet to: Dark yellowish brown, well sorted, Silty CLAY, plastic, cohesive, moist (CL). Changing at 116.9 feet to: Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Changing at 119.0 feet to: Dark yellowish brown, well sorted SILT, some fine grained Sand, slightly cohesive, wet (ML). Changing at 119.1 feet to: Yellowish brown to brown, very well sorted, fine to medium grained SAND, trace Silt, wet (SP). Yellowish brown, well sorted, fine to medium grained SAND, trace Silt, wet (SP). Changing at 121.3 feet to: Grayish brown to to light grayish brown, well sorted, SILT, some fine grained Sand, non-plastic, moderately cohesive, wet (ML). Grayish brown to to light grayish brown, well sorted, SILT, some fine grained Sand, non-plastic, moderately cohesive, wet (ML). Changing at 122.9 feet to: Brown, well sorted, fine grained SAND, some Silt, trace Clay, cohesive, slightly to moderately plastic, moist (SM). Brown, well sorted, fine grained SAND, some Silt, trace Clay, cohesive, slightly to moderately plastic, moist (SM). Gray to grayish brown, well sorted, fine grained SAND, some Silt, trace Clay, cohesive, slightly to moderately plastic, moist (SM). Changing at 126.6 feet to: Gray to grayish brown, well sorted, CLAY & SILT, little fine grained Sand, plastic, cohesive, moist (CL). Gray to grayish brown, well sorted, fine grained SAND, some Silt, trace Clay, cohesive, slightly to moderately plastic, | | | |
| 119 | | | | | | | | | |
| 120 | 61 | 24/24 | 120-122 | 7-10 14-20 | | | | | |
| 121 | | | | | | | | | |
| 122 | 62 | 24/24 | 122-124 | 4-7 13-15 | | | | | |
| 123 | | | | | | | | | |
| 124 | 63 | 24/24 | 124-126 | 5-10 12-20 | | | | | |
| 125 | | | | | | | | | |
| 126 | 64 | 24/24 | 126-128 | 4-10 11-10 | | | | | |
| 127 | | | | | | | | | |
| 128 | 65 | 24/24 | 128-130 | 7-12 9-15 | | | | | |
| 129 | | | | | | | | | |
| 130 | 66 | 24/24 | 130-132 | 2-4 7-9 | | | | | |
| 131 | | | | | | | | | |
| 132 | 67 | 24/24 | 132-134 | 1-4 5-6 | | | | 1 | |
| 133 | | | | | | | | | |
| 134 | 68 | 24/24 | 134-136 | 1-3 5-6 | | | | | |
| 135 | | | | | | | | | |
| 136 | 69 | 24/24 | 136-138 | 1-1 | | | | | |

**REMARKS**

1. Groundwater was encountered at approximately 132.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 137 | | | | 2-6 | | moist (SM). Gray to grayish brown, well sorted, fine grained SAND, some Silt, trace Clay, cohesive, slightly to moderately plastic, moist (SM). | | | |
| 138 | 70 | 24/24 | 138-140 | 0-1<br>1-5 | | Gray to grayish brown, well sorted, fine grained SAND, some Silt, trace Clay, cohesive, slightly to moderately plastic, moist (SM). Changing at 132.4 feet to: Grayish brown to brown, very well sorted, SILT, trace Clay, moderately cohesive, non to slightly plastic, wet | | | |
| 139 | | | | | | | | | |
| 140 | 71 | 24/24 | 140-142 | 0-4<br>8-14 | | Varved, grayish brown, very well sorted, SILT, some Clay, some fine grained Sand, cohesive and slightly to moderately plstic, moist to wet (ML). | | | |
| 141 | | | | | | | | | |
| 142 | 72 | 24/24 | 142-144 | 6-10<br>12-16 | | Brown, well sorted, SILT, little Clay, moderately plastic, cohesive, moist to wet (ML). Changing at 136.3 feet to: Grayish brown, very well sorted, SILT, trace Clay, cohesive, slightly plastic, moist to wet (ML). | | | |
| 143 | | | | | | | | | |
| 144 | 73 | 24/24 | 144-146 | | | Changing at 136.4 feet to: Grayish brown, very well sorted, fine grained SAND, little Silt, slightly cohesive, wet (SM). | | | |
| 145 | | | | | | | | | |
| 146 | 74 | 24/24 | 146-148 | 3-6<br>14-20 | | Grayish brown, very well sorted, fine grained SAND, little Silt, slightly cohesive, wet (SM). Changing 138.9 feet to: Grayish brown, very well sorted, fine grained SAND, trace Silt, wet (SP). Changing at 139.0 feet to: Grayish brown, very well sorted, fine grained SAND, little Silt, slightly cohesive, wet (SM). | | | |
| 147 | | | | | | | | | |
| 148 | 75 | 24/24 | 148-150 | 1-2<br>5-15 | | Yellowish brown, very well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 149 | | | | | | | | | |
| 150 | 76 | 24/24 | 150-152 | 6-12<br>25-33 | | Yellowish brown, very well sorted, fine grained SAND, little Silt, wet (SM). Changing at 143.5 feet to: Grayish brown, very well sorted, SILT, trace fine grained Sand, moderately cohesive, wet (ML). | | | |
| 151 | | | | | | | | | |
| 152 | 77 | 24/24 | 152-154 | 1-1<br>3-7 | | Grayish brown, very well sorted, fine grained SAND, trace Silt, wet (SP). Grayish brown to brown, very well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 153 | | | | | | | | | |
| 154 | 78 | 24/24 | 154-156 | 1-4<br>14-18 | | Changing at 146.6 feet to: Yellowish brown, well sorted, fine grained SAND, trace Silt, wet (SP). Changing at 146.7 feet to: Grayish brown to brown, very well sorted, SILT, little fine grained SAND, wet (ML). | | | |
| 155 | | | | | | | | | |
| 156 | 79 | 24/24 | 156-158 | 1-8<br>24-35 | | Grayish brown to brown, very well sorted, SILT, little fine grained SAND, wet (ML). Grayish brown to brown, very well sorted, fine grained SAND, little Silt, slightly cohesive, wet (SM). Changing at 150.5 feet to: Grayish brown to brown, very well sorted, SILT, moderately cohesive, wet (ML). | | | |
| 157 | | | | | | | | | |
| 158 | 80 | 24/24 | 158-160 | 4-8<br>9-22 | | Changing at 151.9 feet to: Grayish brown to brown, very well sorted, SILT, moderately cohesive, wet (ML). Brown to yellowish brown, very well sorted, | | | |
| 159 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI 62355.52 HOUSE STREET COMPLETE.GPJ WI_DNR.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 8 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 81 | 17/17 | 160-161.4 | 7-31-87/5" | | fine grained SAND, little Silt, wet (SM). Brown to yellowish brown, very well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 161 | | | | | | Brown to yellowish brown, very well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 162 | 82 | 24/0 | 162-164 | 4-8<br>15-10 | | Changing at 156.6 feet to: Dark grayish brown to dark brown, very well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 163 | | | | | | Dark grayish brown to dark brown, very well sorted, fine grained SAND, little Silt, wet (SM). | | | |
| 164 | 83 | 12/6 | 164-165 | 13-50\6" | | Very dense, light brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 165 | | | | | | NO RECOVERY. Bailer soil is fine Sand, little to trace Silt. | | | |
| 166 | 84 | 24/8 | 166-168 | 6-20<br>35-50 | | Very dense, brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 167 | | | | | | Very dense, brown, fine SAND, little to trace Silt wet (SM). | | | |
| 168 | 85 | 17/10 | 168-169.4 | 5-23-50/5" | | Very dense, brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 169 | | | | | | | | | |
| 170 | 86 | 16/0 | 170-171.3 | 6-23-50/4" | | NO RECOVERY. Bailer soil is fine Sand, little to trace Silt. | | | |
| 171 | | | | | | | | | |
| 172 | 87 | 23/12 | 172-173.9 | 3-10<br>35-50/5" | | Very dense, brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 173 | | | | | | | | | |
| 174 | 88 | 17/0 | 174-175.4 | 6-31-50/5" | | NO RECOVERY. Bailer soil is fine Sand, little to trace Silt. | | | |
| 175 | | | | | | | | | |
| 176 | 89 | 17/0 | 176-177.4 | 4-40-50/5" | | NO RECOVERY. Bailer soil is fine Sand, little to trace Silt. | | | |
| 177 | | | | | | | | | |
| 178 | 90 | 12/0 | 178-179 | 15-67 | | NO RECOVERY. Bailer soils is fine Sand, little to trace Silt. | | | |
| 179 | | | | | | | | | |
| 180 | 91 | 18/0 | 180-181.5 | 7-3-90/6" | | NO RECOVERY. Bailer soil is fine Sand, little to trace Silt. | | | |
| 181 | | | | | | | | | |
| 182 | 92 | 24/24 | 182-184 | 11-16<br>27-33 | | Dense, light brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 183 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 9 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 184 | 93 | 24/8 | 184-186 | 9-18 30-52 | | Dense, light brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 185 | | | | | | | | | |
| 186 | 94 | 24/6 | 186-188 | 16-23 48-55 | | Very dense, light brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 187 | | | | | | | | | |
| 188 | 95 | 24/6 | 188-190 | 8-12 35-58 | | Dense, light brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 189 | | | | | | | | | |
| 190 | 96 | 24/8 | 190-192 | 5-13 19-25 | | Dense, light brown, gray, fine SAND, little to trace Silt, wet (SM). | | | |
| 191 | | | | | | | | | |
| 192 | 97 | 24/10 | 192-194 | 13-26 35-41 | | Very dense, brown, fine to medium SAND, little to trace Silt, wet (SM). | | | |
| 193 | | | | | | | | | |
| 194 | 98 | 24/10 | 194-196 | 9-20 42-50 | | Very dense, light brown, fine to medium SAND, little to trace Silt, wet (SM). | | | |
| 195 | | | | | | | | | |
| 196 | 99 | 24/0 | 196-198 | 7-22-62/6" | | NO RECOVERY. Bailer soil is light brown gray, fine to medium Sand, little to trace Silt, wet. | | | |
| 197 | | | | | | | | | |
| 198 | 100 | 24/1 | 198-200 | 10-12 32-44 | | Dense, gray to light brown, fine SAND, little to trace Silt, wet (SM). | | | |
| 199 | | | | | | | | | |
| 200 | 101 | 24/10 | 200-202 | 10-18 32-48 | | Very dense, gray to light brown, fine to medium SAND, little to trace Silt, wet (SM). | | | |
| 201 | | | | | | | | | |
| 202 | 102 | 24/6 | 202-204 | 5-9 20-28 | | Medium dense, gray to light brown, fine to medium SAND, little to trace Silt, wet (ML). | | | |
| 203 | | | | | | | | | |
| 204 | 103 | 24/16 | 204-206 | 7-14 20-33 | | Dense, gray to light brown, medium SAND, little to trace Silt, wet (SM). | | | |
| 205 | | | | | | | | | |
| 206 | 104 | 24/14 | 206-208 | 6-17 | | Very dense, gray, medium to coarse SAND, | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

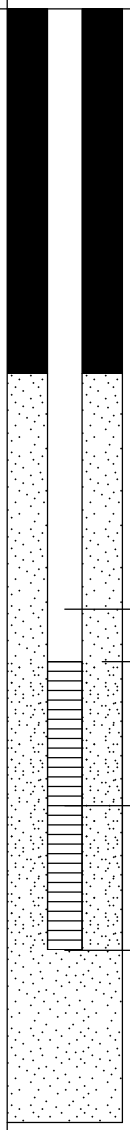
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17D
**Page:** 10 **of** 10
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 207 | | | | 27-40 | | trace Silt, wet (SW). | | |
| 208 | 105 | 24/16 | 208-210 | 9-23<br>32-59 | | Very dense, gray, medium to coarse SAND, trace Silt, wet (SW). Changing at 208.8 feet to: Very dense, gray, fine SAND, little Silt, wet (SM). | | |
| 209 | | | | | | | | |
| 210 | 106 | 24/6 | 210-212 | 9-11<br>14-17 | | Medium dense, gray and brown, fine SAND, little to trace Silt, wet (SM). | | |
| 211 | | | | | | | | |
| 212 | 107 | 24/0 | 212-214 | 4-7<br>26-33 | | NO RECOVERY. BAiler soil is fine to coarse Sand, little to trace Silt, wet. | | |
| 213 | | | | | | | | |
| 214 | 108 | 24/12 | 214-216 | 4-7<br>26-33 | | Dense, gray, fine to coarse SAND, little Silt, wet (SM). | | |
| 215 | | | | | | | | |
| 216 | 109 | 24/10 | 216-218 | 4-8<br>8-30 | | Medium dense, gray and brown, fine to medium SAND, little to trace Silt, wet (SM). | | |
| 217 | | | | | | | | |
| 218 | 110 | 24/12 | 218-220 | 5-14<br>34-30 | | Dense, gray and brown, fine to medium SAND, little to trace Silt, wet (SM). | | |
| 219 | | | | | | | | |
| 220 | 111 | 24/0 | 220-222 | 5-7<br>22-33 | | NO RECOVERY. | | |
| 221 | | | | | | | | |
| 222 | 112 | 24/12 | 222-224 | 4-6<br>33-33 | | Dense, brown, fine SAND, little Silt, wet (SM). Changing at 223.7 feet to: GRAVEL (potential Bedrock). | | |
| 223 | | | | | | | | |
| 224 | 113 | 24/14 | 224-226 | 41-35<br>45-48 | | Gray, potential weathered BEDROCK. Changing at 13.2 feet to: Brown, Clayey SILT, trace fine to coarse Sand, wet (ML). | | |
| 225 | | | | | | | | |
| 226 | | | | | | Bottom of Borehole at 226.0 Feet | | |
| 227 | | | | | | | | |
| 228 | | | | | | | | |
| 229 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17D

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17M
**Page:** 1 **of** 8
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Christopher Melby
**Date Start/Finish:** 3-2-18 / 3-5-18
**Boring Location:** 583,270.5304 N; 12,789,269.7897 E
**GS Elev.:** 784.2' **Datum:**

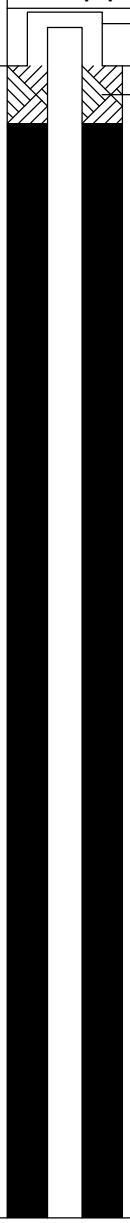
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" |
| **Hammer Wt.:** | 140lbs | 1 3/8" |
| **Hammer Fall:** | 30.0" | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See PMW-17D/MW-1D boring log for detailed soil descriptions. | SAND | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17M
**Page:** 2 **of** 8
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17M
**Page:** 3 **of** 8
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17M
**Page:** 4 **of** 8
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 67 | | | | | | | SAND | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | Grout |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17M
**Page:** 5 **of** 8
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | | | | | | | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17M
**Page:** 6 **of** 8
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 114 | | | | | | | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | |
| 119 | | | | | | | | | |
| 120 | | | | | | | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | |
| 123 | | | | | | | | | |
| 124 | | | | | | | | | |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | | | | | | | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | | | | | | | | | |
| 135 | | | | | | | | | |
| 136 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17M
**Page:** 7 **of** 8
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 137 | | | | | | | SAND | | |
| 138 | | | | | | | | | |
| 139 | | | | | | | | | |
| 140 | | | | | | | | | |
| 141 | | | | | | | | | |
| 142 | | | | | | | | | |
| 143 | | | | | | | | | |
| 144 | | | | | | | | | |
| 145 | | | | | | | | | |
| 146 | | | | | | | | | |
| 147 | | | | | | | | | |
| 148 | | | | | | | | | |
| 149 | | | | | | | | | |
| 150 | | | | | | | | | |
| 151 | | | | | | | | | |
| 152 | | | | | | | | | |
| 153 | | | | | | | | | |
| 154 | | | | | | | | | |
| 155 | | | | | | | | | |
| 156 | | | | | | | | | |
| 157 | | | | | | | | | |
| 158 | | | | | | | | | |
| 159 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

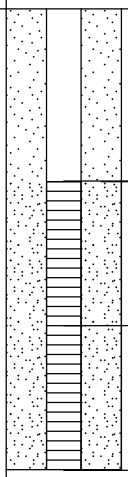
**Boring No.:** HS-MW-17M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17M
**Page:** 8 **of** 8
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 161 | | | | | | | | | |
| 162 | | | | | | | | | |
| 163 | | | | | | | | | Top of Well Screen |
| 164 | | | | | | | | | Silica Sand Filter Pack |
| 165 | | | | | | | | | |
| 166 | 1 | 24 | 166-168 | | | Brown, fine SAND, little to trace Silt. | | 1 | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 167 | | | | | | | | | |
| 168 | | | | | | Bottom of Borehole at 168.0 Feet | 168' | 2 | Bottom of Well Screen |
| 169 | | | | | | | | | |
| 170 | | | | | | | | | |
| 171 | | | | | | | | | |
| 172 | | | | | | | | | |
| 173 | | | | | | | | | |
| 174 | | | | | | | | | |
| 175 | | | | | | | | | |
| 176 | | | | | | | | | |
| 177 | | | | | | | | | |
| 178 | | | | | | | | | |
| 179 | | | | | | | | | |
| 180 | | | | | | | | | |
| 181 | | | | | | | | | |
| 182 | | | | | | | | | |
| 183 | | | | | | | | | |



**REMARKS**

1. Soil descriptions based on auger cuttings.
2. Monitoring well was installed in borehole upon completion. Well screen set from approximately 163.0 to 168.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17M

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17S
**Page:** 1 **of** 5
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Christopher Melby
**Date Start/Finish:** 2-27-18 / 2-28-18
**Boring Location:** 583,273.6951 N; 12,789,266.1009 E
**GS Elev.:** 784.8' **Datum:**

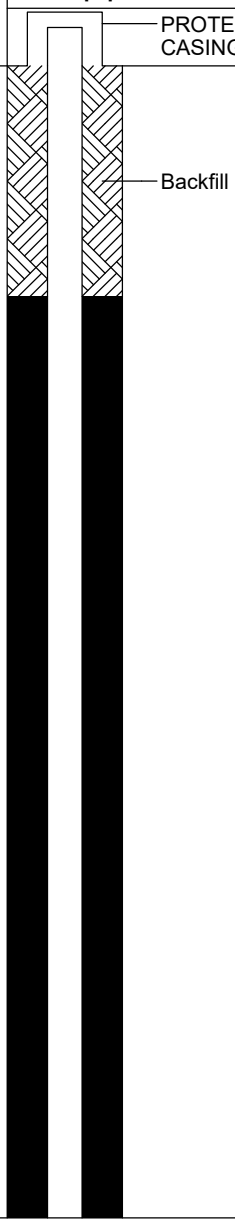
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" |
| **Hammer Wt.:** | 140lbs | 1 3/8" |
| **Hammer Fall:** | 30.0" | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See PMW-17D/MW-1D boring log for detailed soil descriptions. | See PMW-17D/MW-1D for Stratum Descriptions | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17S
**Page:** 2 **of** 5
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 21 | | | | | | | See PMW-17D/MW-1D for Stratum Descriptions | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17S
**Page:** 3 **of** 5
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 44 | | | | | | | See PMW-17D/MW-1D for Stratum Descriptions | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | Bentonite/Grout |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17S
**Page:** 4 **of** 5
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 67 | | | | | | | See PMW-17D/MW-1D for Stratum Descriptions | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17S

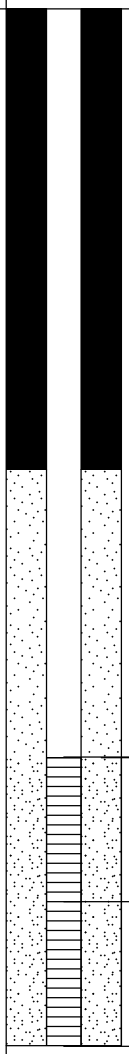
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-17S
**Page:** 5 **of** 5
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 91 | | | | | | | See PMW-17D/MW-1D for Stratum Descriptions | |
| 92 | | | | | | | | |
| 93 | | | | | | | | |
| 94 | | | | | | | | |
| 95 | | | | | | | | |
| 96 | | | | | | | | |
| 97 | | | | | | | | |
| 98 | | | | | | | | |
| 99 | | | | | | | | |
| 100 | | | | | | | | |
| 101 | | | | | | | | |
| 102 | | | | | | | | |
| 103 | | | | | | | | |
| 104 | 1 | 24/16 | 104-106 | 11-5<br>10-10 | | Medium dense, brown, fine to medium SAND, trace Silt, wet (SP). | 104'<br>SAND (SP) | |
| 105 | | | | | | | | |
| 106 | | | | | | Bottom of Borehole at 106.0 Feet | | 1 |
| 107 | | | | | | | | |
| 108 | | | | | | | 108' | |
| 109 | | | | | | | | |
| 110 | | | | | | | | |
| 111 | | | | | | | | |
| 112 | | | | | | | | |
| 113 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from approximately 103.0 to 108.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-17S

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-18S
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Burt
**Logged by:** Kevin Hedinger
**Date Start/Finish:** 5-14-18 / 5-16-18
**Boring Location:** 582,018.9901 N; 12,791,903.6374 E
**GS Elev.:** 683.9' **Datum:**

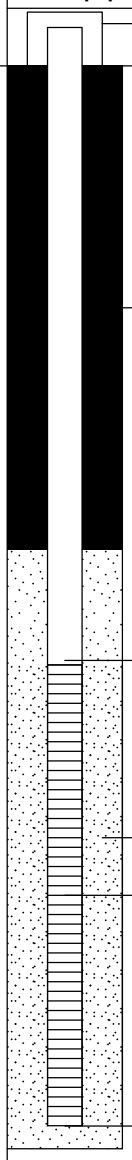
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–23 | | | | | | See SB-18/MW-18D boring log for sample description and classification. | | |
| 24 | | | | | | Bottom of Borehole at 23.5 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 13.0 to 23.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-18S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-19D
**Page:** 1 **of** 4
**File No.:** 16.0062335.52
**Check:**

**Contractor:** Cascade Drilling
**Foreman:** Jason
**Logged by:** Ken Oanes
**Date Start/Finish:** 1-8-18 / 1-8-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | NA | NA |

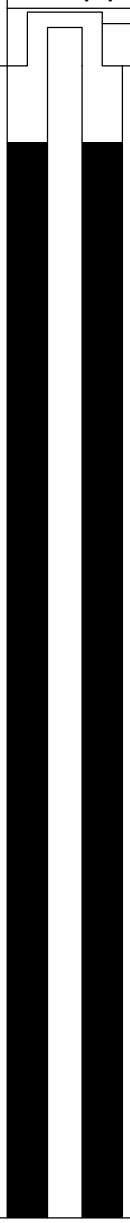
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 60/60 | 0-5 | | 0.7 ppm <0.25 tsf | Very soft, black, SILT, contains Organics (topsoil), trace Gravel, moist (ML). Changing at 2.0 feet to: Loose, light brown, Silty fine to coarse GRAVEL, sub-angular, some Sand, moist (GM). | SILT (ML) | 1 2 |
| 2 | | | | | | | 2' GRAVEL (GM) | |
| 3 | | | | | 1.6 ppm | | | |
| 4 | | | | | | | | |
| 5 | 2 | 60/60 | 5-10 | | 1.6 ppm | Loose, brown, well graded, fine to coarse SAND and GRAVEL, sub-angular to sub-rounded, some lithics, trace Silt, moist (SW). | 5' SAND (SW) | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | 1.5 ppm | | | |
| 9 | | | | | | | | |
| 10 | 3 | 60/60 | 10-15 | | 2.8 ppm | Loose, brown, well graded, fine to coarse SAND and GRAVEL, sub-angular to sub-rounded, some lithics, trace Silt, moist (SW). | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | 2.7 ppm | | | |
| 15 | 4 | 60/60 | 15-20 | | 3.9 ppm | Stiff, light brown, Silty fine SAND, trace fine Gravel, moist (SM). | 15' SAND (SM) | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | 4.3 ppm | | | |
| 19 | | | | | | | | |
| 20 | 5 | 60/60 | 20-25 | | 5.8 ppm | Stiff, light brown, Silty fine SAND, trace fine Gravel, moist (SM). | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | 4.2 ppm | | | |
| 24 | | | | | | | | |
| 25 | 6 | 60/60 | 25-30 | | 3.5 ppm >4.5 tsf | Stiff, dark gray, Silty CLAY, trace fine Sand, trace fine Gravel, moist (CL). | 25' CLAY (CL) | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | 2.5 ppm | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.
2. Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate consisency of cohesive soil.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-19D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-19D
**Page:** 2 **of** 4
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 60/60 | 30-35 | | 5.4 ppm >4.0 tsf | Stiff, dark gray, Silty CLAY, trace fine Sand, trace fine Gravel, moist (CL). | CLAY (CL) | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | 3.3 ppm | | | | |
| 34 | | | | | | | | | |
| 35 | 8 | 60 | 35-40 | | 5.8 ppm >4.0 tsf | Stiff, dark gray, Silty CLAY, trace fine Sand, trace fine Gravel, moist (CL). | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | 5.6 ppm | | | | |
| 39 | | | | | | | | | |
| 40 | 9 | 60/60 | 40-45 | | 11.8 ppm >4.0 tsf | Stiff, dark gray, Silty CLAY, trace fine Sand, trace fine Gravel, moist (CL). | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | Grout |
| 43 | | | | | 10.7 ppm | | | | |
| 44 | | | | | | | | | |
| 45 | 10 | 60/60 | 45-50 | | 7.2 ppm >4.0 tsf | Stiff, dark gray, Silty CLAY, trace fine Sand, trace fine Gravel, moist (CL). | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | 11.9 ppm | | | | |
| 49 | | | | | | | | | |
| 50 | 11 | 60/60 | 50-55 | | 2.6 ppm >4.5 tsf | Stiff, dark gray, Silty CLAY, trace fine Sand, trace fine Gravel, moist (CL). | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | 10.1 ppm | | | | |
| 54 | | | | | | | | | |
| 55 | 12 | 60/60 | 55-60 | | 0.7 ppm >4.0 tsf | Hard, light gray, Silty CLAY, trace coarse Sand, trace fine Gravel, moist (CL). Changing at 57.0 feet to: Loose, gray, poorly graded, fine SAND, some lithics, sub-rounded, little Silt, wet (SM). Changing at 59.0 feet to: Stiff, gray, SILT, trace fine Sand, trace fine Gravel, wet (ML). | | 3 4 | |
| 56 | | | | | | | | | |
| 57 | | | | | | | 57' SAND (SM) | | |
| 58 | | | | | | | | | |
| 59 | | | | | 1.5 tsf | | 59' SILT (ML) | | |
| 60 | 13 | 60/60 | 60-65 | | 3.0 ppm >4.0 tsf | Hard, gray, Silty CLAY, trace coarse Sand, trace fine Gravel, sub-angular, moist (CL). | 60' CLAY (CL) | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | 4.8 ppm | | | | |
| 64 | | | | | | | | | |

**REMARKS**

3. Groundwater was encountered 55.0 feet below ground surface.
4. Temporary well set at 55.0 to 60.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

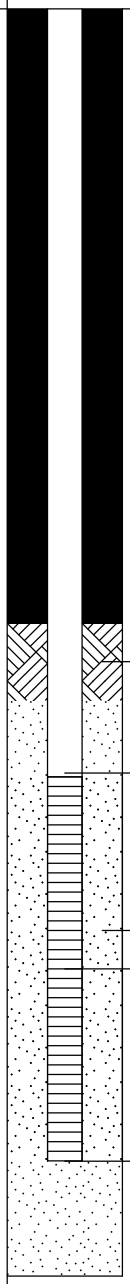
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-19D
**Page:** 3 **of** 4
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 66 | 14 | 60/60 | 65-70 | | 4.2 ppm >4.0 tsf | Hard, gray, Silty CLAY, trace coarse Sand, trace fine Gravel, sub-angular, moist (CL). | CLAY (CL) | |
| 67 | | | | | | | | |
| 68 | | | | | 2.9 ppm | | | |
| 69 | | | | | | | | |
| 70 | 15 | 60/60 | 70-75 | | 7.0 ppm >4.0 tsf | Hard, gray, Silty CLAY, trace coarse Sand, trace fine Gravel with confinement increasing with depth, sub-angular, moist (CL). | | |
| 71 | | | | | | | | |
| 72 | | | | | | | | |
| 73 | | | | | 6.5 ppm | | | |
| 74 | | | | | | | | |
| 75 | 16 | 60/60 | 75-80 | | 10.8 ppm >4.0 tsf | Hard, gray, Silty CLAY, trace coarse Sand, trace fine Gravel with confinement increasing with depth, sub-angular, moist (CL). | | |
| 76 | | | | | | | | |
| 77 | | | | | | | | |
| 78 | | | | | 4.0 ppm | | | |
| 79 | | | | | | | | |
| 80 | 17 | 60/60 | 80-85 | | 2.0 ppm | Loose, brown, Silty fine SAND, some medium to coarse Sand, trace Gravel, sub-angular, wet (SM). Changing at 81.0 feet to: Loose, brown, well graded, fine to coarse SAND and fine to coarse GRAVEL, sub-angular to agular gravel content increasing with depth, wet (SW). | 80' SAND (SM) | 5 |
| 81 | | | | | | | 81' SAND (SW) | 6 |
| 82 | | | | | | | | |
| 83 | | | | | 0.3 ppm | | | |
| 84 | | | | | | | | |
| 85 | 18 | 60/60 | 85-90 | | 8.2 ppm | Loose, brown, well graded, fine to coarse SAND and fine to coarse GRAVEL, sub-angular to agular gravel content increasing with depth, wet (SW). | | |
| 86 | | | | | | | | |
| 87 | | | | | | | | |
| 88 | | | | | 0.2 ppm | | | |
| 89 | | | | | | | | |
| 90 | 19 | 60 | 90-95 | | 0.4 ppm | Loose, dark gray, fine to coarse SAND and fine to coare GRAVEL, sub-angular, trace Silt, wet with 3 inch Cobble at 91.3 feet (SW). | | 7 |
| 91 | | | | | | | | |
| 92 | | | | | | | | |
| 93 | | | | | 0.3 ppm | | | |
| 94 | | | | | | | | |
| 95 | 20 | 60/60 | 95-100 | | 0.1 ppm >4.5 tsf | Hard, dark gray, CLAY, trace fine Sand, trace Gravel, easily rolls 1/8" ribbon, moist (CL). | 95' CLAY (CL) | |
| 96 | | | | | | | | |
| 97 | | | | | | | | |
| 98 | | | | | 0.1 ppm | | | |
| 99 | | | | | | | | |

**Equipment Installed**




**REMARKS**

5. Groundwater was encountered at approximately 80.0 feet below ground surface.
6. Temporary well set at 80.0 to 85.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
7. Temporary well set at 90.0 to 95.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-19D

BORING_WELL_6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-19D
**Page:** 4 **of** 4
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 60/60 | 100-105 | | 0.3 ppm >4.5 tsf | Hard, dark gray, lean CLAY, low plasticity, moist (CL). Changing at 104.0 feet to: Stiff, dark gray, SILT with Clay, low plasticity, wet (ML). | CLAY (CL) | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | 0.4 ppm 1.5 tsf | | | | |
| 104 | | | | | | | 104' SILT (ML) | | |
| 105 | 22 | 60/60 | 105-110 | | 0.8 ppm 1.0 tsf | Stiff, dark gray, SILT with Clay, low plasticity, trace fine Sand increasing with depth, wet (ML). | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | 0.7 ppm | | | | |
| 109 | | | | | | | | | |
| 110 | | | | | | | 110' | | |
| | 23 | 60/60 | 110-115 | | 0.4 ppm 0.5 tsf | Soft, gray, poorly graded, fine SAND, trace Silt, wet (SP). Changing at 111.3 feet to: Hard, dark gray, CLAY with some Silt, moist (CL). | SAND (SP) | 8 | |
| 111 | | | | | | | 111.3' CLAY (CL) | | |
| 112 | | | | | | | | | |
| 113 | | | | | 0.7 ppm >4.5 tsf | | | | |
| 114 | | | | | | | | | |
| 115 | 24 | 60/60 | 115-120 | | 0.7 ppm 1.0 tsf | Medium stiff, dark gray, Silty CLAY, moist (CL). | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | 0.5 ppm | | | | |
| 119 | | | | | | | | | |
| 120 | 25 | 60/60 | 120-125 | | 0.8 ppm 4.0 tsf | Hard, gray, CLAY, some Silt, trace Gravel, moist (CL). Changing at 121.3 feet to: Hard, red, CLAY, some Silt, Gypsum inclusions, dry (CL). | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | |
| 123 | | | | | 1.0 ppm >4.5 tsf | | | | |
| 124 | | | | | | | | | |
| 125 | | | | | | | 125' | | |
| | | | | | | Bottom of Borehole at 125.0 Feet | | 9 | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | | | | | | | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | | | | | | | | | |

**REMARKS**

8. Insufficient groundwater yeild for temporary well.
9. Monitoring well was installed in borehole upon completion. Well screen set from 85.0 to 95.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-19D

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-19S
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:**

**Contractor:** Cascade Drilling
**Foreman:** Jason
**Logged by:** John Morehouse
**Date Start/Finish:** 1-16-18 / 1-16-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | NA | NA |

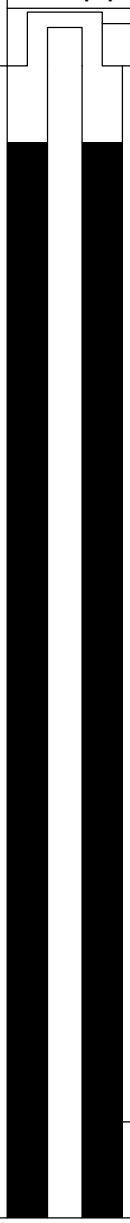
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-19D boring log for sample description and classification. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-19S

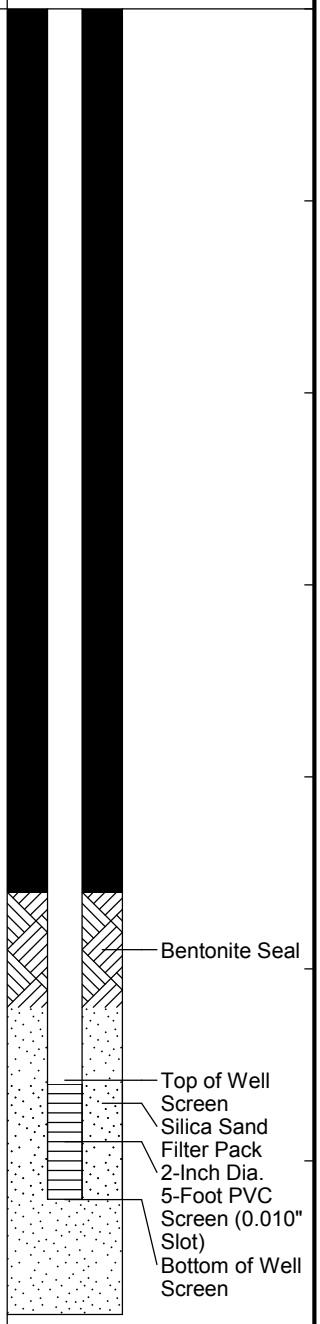
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-19S
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | | | |
| 61 | | | | | | Bottom of Borehole at 61.0 Feet | | 1 |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 58.0 to 61.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-19S

BORING_WELL_6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

# 1855 House Street: Off-Site Borings
## 6868 Wild Wood Creek Road, NE
## Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 1 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-15-18 / 11-17-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | NA |
| **Hammer Wt.:** | 140 lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

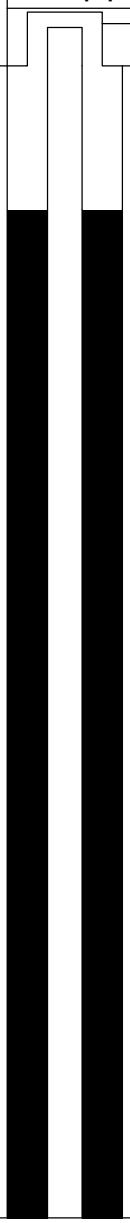
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/10.8 | 0-2 | 0-0<br>1-1 | 0.0 ppm | Very dark brown, well sorted SILT and fine grained Sand, moist. Changing at 0.4 feet to: Yellowish-brown, moderately sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist. Changing at 0.9 feet to: NO RECOVERY. | SILT<br>0.4'<br>SAND<br>0.9'<br>NO RECOVERY | 1 |
| 1 | | | | | | | | |
| 2 | 2 | 24/1.2 | 2-4 | 2-3<br>3-3 | 0.0 ppm | Yellowish-brown, moderately sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist. Changing at 2.1 feet to: NO RECOVERY. | 2'<br>2.1' SAND<br>NO RECOVERY | |
| 3 | | | | | | | | |
| 4 | 3 | 24/15.6 | 4-6 | 3-4<br>5-5 | 0.0 ppm | Yellowish-brown, moderatelty sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist. Changing at 4.5 feet to: Dark yellowish-brown, poorly sorted, SILT, some fine grained Sand, trace Gravel, trace Clay, non to slightly plastic, moderately cohesive, moist. Changing at 4.8 feet to: Yellowish-brown, moderately sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist. Changing at 5.3 feet to: NO RECOVERY. | 4'<br>SAND<br>4.5'<br>SILT<br>4.8'<br>SAND<br>5.3'<br>NO RECOVERY | |
| 5 | | | | | | | | |
| 6 | 4 | 24/16.8 | 6-8 | 2-3<br>3-3 | 0.0 ppm | Dark yellowish-brown, poorly sorted, fine to coarse grained SAND, trace Gravel, trace Silt, moist. Changing at 6.6 feet to: Light yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 7.4 feet to: NO RECOVERY. | 6'<br>SAND<br>7.4'<br>NO RECOVERY<br>8' | |
| 7 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samles for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million (ppm) of isobutylene. Groundwater was measured at 0.0 ppm.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 2 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 5 | 24/8.4 | 8-10 | 3-4<br>4-5 | 0.0 ppm | Light yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 8.6 feet to: Light yellowish-brown to pale brown, poorly sorted, fine to coarse grained SAND, some Gravel, trace Silt, moist. Changing at 8.7 feet to: NO RECOVERY. | SAND<br>8.7'<br>NO RECOVERY<br>10' | | |
| 9 | | | | | | | | | |
| 10 | 6 | 24/13.2 | 10-12 | 4-5<br>5-6 | 0.0 ppm | Light yellowish-brown to pale brown, moderately sorted fine to medium grained SAND, little coarse grained Sand, trace Silt, moist. Changing at 10.2 feet to: Light yellowish-brown to pale brown, poorly sorted, fine to coarse grained SAND, some Gravel, trace Silt, moist. Changing at 11.1 feet to: NO RECOVERY. | SAND<br>11.1'<br>NO RECOVERY<br>12' | | |
| 11 | | | | | | | | | |
| 12 | 7 | 24/12 | 12-14 | 6-10<br>8-8 | 0.0 ppm | Yellowish-brown, poorly sorted, fine to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 12.5 feet to: Yellowish-brown, poorly sorted, medium to coarse grained SAND, trace Gravel, trace Silt, moist. Changing at 13.0 feet to: NO RECOVERY. | SAND<br>13'<br>NO RECOVERY<br>14' | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/14.4 | 14-16 | 4-5<br>9-14 | 0.0 ppm | Yellowish-brown, poorly sorted, medium to coarse grained SAND, trace Gravel, trace Silt, moist. Changing at 15.0 feet to: GRAVEL, fractured Cobble. Changing at 15.2 feet to: NO RECOVERY. | SAND<br>15'<br>GRAVEL<br>15.2'<br>NO RECOVERY<br>16' | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/14.4 | 16-18 | 8-14<br>14-14 | 0.0 ppm | Yellowish-brown, poorly sorted, medium to coarse SAND, little Gravel, trace Silt, moist. Changing at 17.2 feet to: NO RECOVERY. | SAND<br>17.2' | | |
| 17 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 3 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NO RECOVERY | | |
| 18 | 10 | 24/14.4 | 18-20 | 9-11 11-14 | 0.0 ppm | Yellowish-brown, poorly sorted, medium to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 19.2 feet to: NO RECOVERY. | 18' SAND | | |
| 19 | | | | | | | 19.2' NO RECOVERY | | |
| 20 | 11 | 24/14.4 | 20-22 | 11-22 23-19 | 0.0 ppm | Yellowish-brown, poorly sorted, medium to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 21.2 feet to: NO RECOVERY. | 20' SAND | | |
| 21 | | | | | | | 21.2' NO RECOVERY | | |
| 22 | 12 | 24/15.6 | 22-24 | 5-13 15-14 | 0.0 ppm | Yellowish-brown, poorly sorted, coarse grained SAND, some Gravel, trace Silt, moist. Changing at 23.3 feet to: NO RECOVERY. | 22' SAND | | |
| 23 | | | | | | | 23.3' NO RECOVERY | | |
| 24 | 13 | 24/14.4 | 24-26 | 5-9 10-11 | 0.0 ppm | Yellowish-brown, poorly sorted, medium to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 25.2 feet to: NO RECOVERY. | 24' SAND | | |
| 25 | | | | | | | 25.2' NO RECOVERY | | |
| 26 | 14 | 24/12 | 26-28 | 4-7 47-17 | 0.0 ppm | Yellowish-brown, poorly sorted, medium to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 26.9 feet to: Very pale brown to pale brown, well sorted, fine | 26' SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-20/MW-20D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 4 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | to medium grained SAND, trace Silt, moist. Changing at 27.0 feet to: NO RECOVERY. | SAND 27' NO RECOVERY | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/19.2 | 28-30 | 3-6 8-15 | 0.0 ppm | Very pale brown to pale brown, well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 28.1 feet to: Very pale brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 29.6 feet to: NO RECOVERY. | 28' SAND 29.6' NO RECOVERY | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/16.8 | 30-32 | 4-7 9-11 | 0.0 ppm | Very pale brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 31.4 feet to: NO RECOVERY. | 30' SAND 31.4' NO RECOVERY | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/15.6 | 32-34 | 3-6 9-10 | 0.0 ppm | Very pale brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 33.3 feet to: NO RECOVERY. | 32' SAND 33.3' NO RECOVERY | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/18 | 34-36 | 3-6 7-9 | 0.0 ppm | Very pale brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 35.5 feet to: NO RECOVERY. | 34' SAND 35.5' NO RECOVERY | | |
| 35 | | | | | | | | | |
| | | | | | | | 36' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 5 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 19 | 24/18 | 36-38 | 3-6<br>8-8 | 0.0 ppm | Very pale brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 37.5 feet to: NO RECOVERY. | SAND | | |
| 37 | | | | | | | 37.5' NO RECOVERY | | |
| 38 | 20 | 24/16.8 | 38-40 | 3-6<br>8-10 | 0.0 ppm | Light yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 39.4 feet to: NO RECOVERY. | 38' SAND | | |
| 39 | | | | | | | 39.4' NO RECOVERY | | |
| 40 | 21 | 24/19.2 | 40-42 | 3-4<br>6-7 | 0.0 ppm | Light yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 41.6 feet to: NO RECOVERY. | 40' SAND | | |
| 41 | | | | | | | 41.6' NO RECOVERY | | |
| 42 | 22 | 24/15.6 | 42-44 | 4-5<br>7-8 | 0.0 ppm | Light yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 43.3 feet to: NO RECOVERY. | 42' SAND | | |
| 43 | | | | | | | 43.3' NO RECOVERY | | |
| 44 | 23 | 24/19.2 | 44-46 | 3-7<br>8-11 | 0.0 ppm | Light yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 45.6 feet to: NO RECOVERY. | 44' SAND | | |
| 45 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 6 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND 45.6' | | |
| | | | | | | | NO RECOVERY 46' | | |
| 46 | 24 | 24/16.8 | 46-48 | 4-5 8-10 | 0.0 ppm | Light yellowish-brown, very well sorted fine to medium grained SAND, trace Silt, moist. Changing at 47.4 feet to: NO RECOVERY. | SAND | | |
| 47 | | | | | | | 47.4' | | |
| | | | | | | | NO RECOVERY 48' | | |
| 48 | 25 | 24/21.6 | 48-50 | 4-6 7-11 | 0.0 ppm | Light yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 49.8 feet to: NO RECOVERY. | SAND | | |
| 49 | | | | | | | 49.8' | | |
| 50 | 26 | 24/21.6 | 50-52 | 4-6 8-12 | 0.0 ppm | Light yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 51.8 feet to: NO RECOVERY. | 50' NO RECOVERY SAND | | |
| 51 | | | | | | | 51.8' | | |
| 52 | 27 | 24/20.4 | 52-54 | 6-9 10-11 | 0.0 ppm | Light yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 53.7 feet to: NO RECOVERY. | 52' NO RECOVERY SAND | | |
| 53 | | | | | | | 53.7' | | |
| 54 | 28 | 24/19.2 | 54-56 | 2-4 6-8 | 0.0 ppm | Light yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 54.3 feet to: Brown, very well sorted, fine to medium grained SAND, trace | 54' NO RECOVERY SAND | 2 | |

**REMARKS**

2. Groundwater was encountered at approximately 54.3 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 7 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Silt, wet. Changing at 55.6 feet: NO RECOVERY. | SAND | | |
| 55 | | | | | | | 55.6' NO RECOVERY 56' | | |
| 56 | 29 | 24/21.6 | 56-58 | 2-4 6-8 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 57.8 feet to: NO RECOVERY. | SAND | | |
| 57 | | | | | | | 57.8' | | |
| 58 | 30 | 24/22.8 | 58-60 | 1-1 2-4 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 59.9 feet to: NO RECOVERY. | 58' NO RECOVERY SAND | | |
| 59 | | | | | | | 59.9' | | |
| 60 | 31 | 24/21.6 | 60-62 | 0-1 1-3 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 61.8 feet to: NO RECOVERY. | 60' NO RECOVERY SAND | | |
| 61 | | | | | | | 61.8' | | Bentonite / Grout |
| 62 | 32 | 24/16.8 | 62-64 | 1-2 2-6 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 63.4 feet to: NO RECOVERY. | 62' NO RECOVERY SAND | | |
| 63 | | | | | | | 63.4' NO RECOVERY 64' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-20/MW-20D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 8 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 33 | 24/22.8 | 64-66 | 2-4<br>4-7 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 65.9 feet to: NO RECOVERY. | SAND | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/18 | 66-68 | 2-2<br>4-6 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 67.5 feet to: NO RECOVERY. | 65.9'<br>66' NO RECOVERY<br>SAND | | |
| 67 | | | | | | | 67.5'<br>NO RECOVERY | | |
| 68 | 35 | 24/19.2 | 68-70 | 8-9<br>7-10 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 69.6 feet to: NO RECOVERY. | 68'<br>SAND | | |
| 69 | | | | | | | 69.6'<br>NO RECOVERY | | |
| 70 | 36 | 24/4.8 | 70-72 | 2-3<br>5-8 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 70.4 feet to: NO RECOVERY. | 70'<br>SAND<br>70.4'<br>NO RECOVERY | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/24 | 72-74 | 2-2<br>3-6 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. | 72'<br>SAND | | |
| 73 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-20/MW-20D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 9 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 74 | 38 | 24/13.2 | 74-76 | 1-0<br>0-0 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 75.1 feet to: NO RECOVERY. | | | |
| 75 | | | | | | | 75.1'<br>NO RECOVERY | | |
| 76 | 39 | 24/21.6 | 76-78 | 1-2<br>5-7 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 77.8 feet to: NO RECOVERY. | 76'<br>SAND | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/9.6 | 78-80 | 3-5<br>6-9 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 78.8 feet to: NO RECOVERY. | 77.8'<br>78' NO RECOVERY<br>SAND | | |
| 79 | | | | | | | 78.8'<br>NO RECOVERY | | |
| 80 | 41 | 24/19.2 | 80-82 | 1-3<br>7-12 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 81.6 feet to: NO RECOVERY. | 80'<br>SAND | | |
| 81 | | | | | | | 81.6'<br>NO RECOVERY | | |
| 82 | 42 | 24/10.8 | 82-84 | 1-2<br>5-7 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 82.9 feet to: NO RECOVERY. | 82'<br>SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-20/MW-20D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 10 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND 82.9' | | |
| 83 | | | | | | | NO RECOVERY | | |
| 84 | 43 | 24/22.8 | 84-86 | 3-4 9-15 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, traceSilt, wet. Changing at 85.9 feet to: NO RECOVERY. | 84' SAND | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/10.8 | 86-88 | 1-1 3-6 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 86.9 feet to: NO RECOVERY. | 85.9' 86' NO RECOVERY SAND | | |
| 87 | | | | | | | 86.9' NO RECOVERY | | |
| 88 | 45 | 24/13.2 | 88-90 | 2-3 5-10 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 89.1 feet to: NO RECOVERY. | 88' SAND | | |
| 89 | | | | | | | 89.1' NO RECOVERY | | |
| 90 | 46 | 24/22.8 | 90-92 | 1-2 4-10 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 91.9 feet to: NO RECOVERY. | 90' SAND | | |
| 91 | | | | | | | 91.9' 92' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-20/MW-20D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 11 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 47 | 24/6 | 92-94 | 1-2<br>5-7 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 92.5 feet to: NO RECOVERY. | NO RECOVERY<br>SAND<br>92.5'<br>NO RECOVERY | | |
| 93 | | | | | | | | | |
| 94 | 48 | 24/18 | 94-96 | 2-1<br>4-8 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 95.5 feet to: NO RECOVERY. | 94'<br>SAND | | |
| 95 | | | | | | | 95.5'<br>NO RECOVERY | | |
| 96 | 49 | 24/15.6 | 96-98 | 0-1<br>2-4 | 0.0 ppm | Brown, very well sorrted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 97.3 feet to: NO RECOVERY. | 96'<br>SAND | | |
| 97 | | | | | | | 97.3'<br>NO RECOVERY | | |
| 98 | 50 | 24/18 | 98-100 | 1-0<br>2-4 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 99.5 feet to: NO RECOVERY. | 98'<br>SAND | | |
| 99 | | | | | | | 99.5'<br>NO RECOVERY | | |
| 100 | 51 | 24/21.6 | 100-102 | 2-3<br>6-10 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 101.8 feet to: NO RECOVERY. | 100'<br>SAND | | |
| 101 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-20/MW-20D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 12 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 102 | 52 | 24/20.4 | 102-104 | 0-1<br>3-4 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 103.7 feet to: NO RECOVERY. | 101.8'<br>102' NO RECOVERY<br>SAND | | |
| 103 | | | | | | | | | |
| 104 | 53 | 24/24 | 104-106 | 2-3<br>8-15 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. | 103.7'<br>104' NO RECOVERY<br>SAND | | |
| 105 | | | | | | | | | |
| 106 | 54 | 24/22.8 | 106-108 | 3-3<br>7-10 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 107.9 feet to: NO RECOVERY. | | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24/22.8 | 108-110 | 1-1<br>2-4 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 109.9 feet to: NO RECOVERY. | 107.9'<br>108' NO RECOVERY<br>SAND | | |
| 109 | | | | | | | | | |
| 110 | 56 | 24/13.2 | 110-112 | 1-3<br>4-9 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 111.1 feet to: NO RECOVERY. | 109.9'<br>110' NO RECOVERY<br>SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 13 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 111 | | | | | | | 111.1' NO RECOVERY | | |
| 112 | 57 | 24/19.2 | 112-114 | 2-3 7-11 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 113.6 feet to: NO RECOVERY. | 112' SAND | | |
| 113 | | | | | | | 113.6' NO RECOVERY | | |
| 114 | 58 | 24/24 | 114-116 | 1-3 5-11 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. | 114' SAND | | |
| 115 | | | | | | | | | |
| 116 | 59 | 24/9.6 | 116-118 | 1-1 3-8 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 116.8 feet to: NO RECOVERY. | 116.8' NO RECOVERY | | |
| 117 | | | | | | | | | |
| 118 | 60 | 24/20.4 | 118-120 | 1-2 5-9 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 119.7 feet to: NO RECOVERY. | 118' SAND | | |
| 119 | | | | | | | 119.7' NO RECOVERY | | |
| 120 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

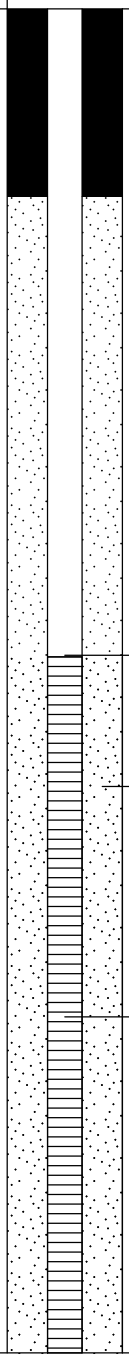
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 14 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 61 | 24/10.8 | 120-122 | 2-3<br>6-10 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 120.9 feet to: NO RECOVERY. | SAND<br>120.9'<br>NO RECOVERY | |
| 121 | | | | | | | | |
| 122 | 62 | 24/22.8 | 122-124 | 3-4<br>9-15 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 123.5 feet to: Dark grayish-brown to dark brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 123.9 feet to: NO RECOVERY. | 122'<br>SAND<br>123.5'<br>Slty CLAY<br>123.9' | |
| 123 | | | | | | | | |
| 124 | 63 | 24/18 | 124-126 | 2-4<br>6-11 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 125.4 feet to: Dark grayish-brown to dark brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 125.5 feet to: NO RECOVERY. | 124' NO RECOVERY<br>SAND | |
| 125 | | | | | | | 125.4'<br>125.5' Silty CLAY<br>NO RECOVERY | |
| 126 | 64 | 24/16.8 | 126-128 | 1-1<br>3-6 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 127.4 feet to: NO RECOVERY. | 126'<br>SAND | |
| 127 | | | | | | | 127.4'<br>NO RECOVERY | |
| 128 | 65 | 24/22.8 | 128-130 | 7-23<br>36-50/4.5" | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 129.5 feet to: Dark gray to dark grayish-brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 129.9 feet to: NO RECOVERY. | 128'<br>SAND | |
| 129 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-20/MW-20D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 15 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 129.5' SAND<br>CLAY & SILT<br>129.9' | | Bottom of Well Screen |
| 130 | 66 | 24/24 | 130-132 | 4-3<br>23-46 | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 130.9 feet to: Dark gray to dark grayish-brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 131.1 feet to: Dark gray, poorly sorted, GRAVEL, some Sand, trace Silt, wet. Changing at 131.3 feet to: Dark gray to dark grayish-brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 131.5 feet to: Brown, well sorted, fine to coarse SAND, trace Silt, wet. Changing at 131.8 feet to: Dark grayish-brown, poorly sorted, coarse SAND, some Gravel, trace Silt, wet. | 130' NO RECOVERY<br>SAND<br>130.9' | | |
| 131 | | | | | | | CLAY & SILT<br>131.1'<br>GRAVEL<br>131.3'<br>CLAY & SILT<br>131.5'<br>SAND | | |
| 132 | 67 | 24/10.8 | 132-134 | 17-50/5.5" | 0.0 ppm | | 132.3'<br>CLAY & SILT | | |
| 133 | | | | | | Brown, very well sorted, fine to medium grained, SAND, trace Silt, wet. Changing at 132.3 feet to: Dark gray to dark grayish-brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 132.9 feet to: NO RECOVERY. | 132.9'<br>NO RECOVERY | | |
| 134 | 68 | 24/6 | 134-136 | 50/6" | 0.0 ppm | Brown, very well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 134.2 feet to: Dark brown, poorly sorted, GRAVEL, fractured Cobble. Changing at 134.5 feet to: NO RECOVERY. | 134'<br>134.2' SAND<br>GRAVEL<br>134.5'<br>NO RECOVERY | | |
| 135 | | | | | | | | | |
| 136 | 69 | 24/1.2 | 136-138 | 50/5.5" | 0.0 ppm | Dark grayish-brown, poorly sorted, GRAVEL, some Clay & Silt, moist. Changing at 136.1 feet to: NO RECOVERY. | 136'<br>136.1' GRAVEL<br>NO RECOVERY | | |
| 137 | | | | | | | | | |
| 138 | 70 | 24/1.2 | 138-140 | 48-50/2" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Gravel, trace Sand, plastic, cohesive, moist. Changing at 138.1 feet to: NO RECOVERY. | 138'<br>138.1' CLAY & SILT<br>NO RECOVERY | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** SB-20/MW-20D
**Page:** 16 **of** 16
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 139 | | | | | | | NO RECOVERY | | |
| 140 | 71 | 24/9.6 | 140-142 | 37-50/4" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Gravel, trace Sand, plastic, cohesive, moist. Changing at 140.8 feet to: NO RECOVERY. | 140' CLAY & SILT | | |
| 141 | | | | | | | 140.8' NO RECOVERY | | |
| 142 | | | | | | Bottom of Borehole at 142.0 Feet | 142' | 3 | |
| 143 | | | | | | | | | |
| 144 | | | | | | | | | |
| 145 | | | | | | | | | |
| 146 | | | | | | | | | |
| 147 | | | | | | | | | |

**REMARKS**

3. Monitoring well MW-20D was installed in borehole upon completion. Well screen set from 124.5 to 129.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-20/MW-20D

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

# 1855 House Street: Off-Site Borings
## 6868 Wild Wood Creek Road, NE
## Belmont, Michigan

**Boring No.:** MW-20M
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-5-18 / 11-6-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | NA |
| **Hammer Wt.:** | 140 lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

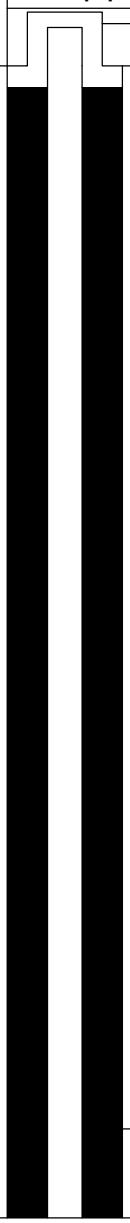
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | | 0 | | | See SB-20/MW-20D boring log for detailed soil descriptions. | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



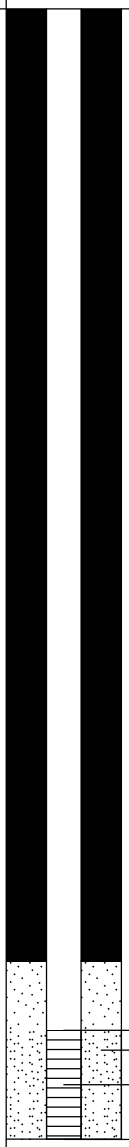
BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** MW-20M
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 54–104 | | | | | | | | | |
| 105 | | | | | | Bottom of Borehole at 105.0 Feet | | 1 | |
| 106–114 | | | | | | | | | |




**REMARKS**

1. Monitoring well was intalled in borehole upon completion. Well screen set from approximately 100.0 to 105.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-20M

BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

# 1855 House Street: Off-Site Borings
## 6868 Wild Wood Creek Road, NE
## Belmont, Michigan

**Boring No.:** MW-20S
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-5-18 / 11-6-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | NA |
| **Hammer Wt.:** | 140 lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

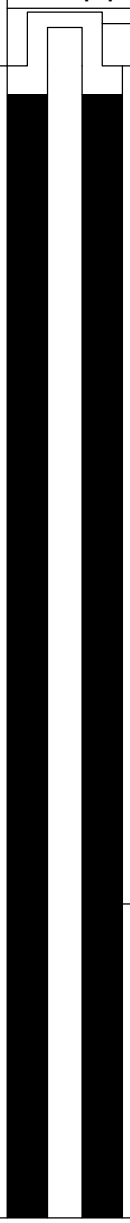
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | | 0 | | | See SB-20/MW-20D boring log for detailed soil descriptions. | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-20S

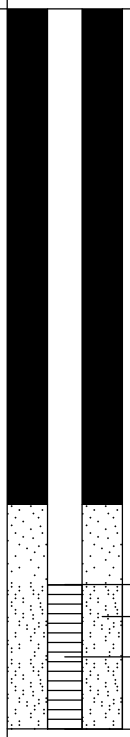
BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
6868 Wild Wood Creek Road, NE
Belmont, Michigan

**Boring No.:** MW-20S
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 41–64 | | | | | | | | | |
| 65 | | | | | | Bottom of Borehole at 65.0 Feet | | 1 | |
| 66–86 | | | | | | | | | |




**REMARKS**

1. Monitoring well was intalled in borehole upon completion. Well screen set from approximately 60.0 to 65.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-20S

BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS WILD WOOD CREEK.GPJ GZA_CORP.GDT 2/27/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-21D
**Page:** 1 **of** 3
**File No.:** 16.0062335.52
**Check:**

**Contractor:** Cascade Drilling
**Foreman:** Jason
**Logged by:** Ken Oanes
**Date Start/Finish:** 1-2-18 / 1-2-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | NA | NA |

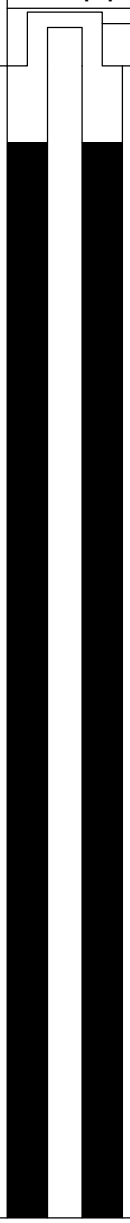
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 60/60 | 0-5 | | 1.7 ppm | Loose, black, Silty SAND with Organic Matter (roots), moist (SM). Changing at 1.3 feet to: Loose, light brown, well graded, SAND, trace Gravel, sub-angular to sub-rounded, coarser at 4.5 feet (SM). | SAND (SM) | 1 |
| 2 | | | | | | | 1.3' SAND (SW) | |
| 3 | | | | | 0.8 ppm | | | |
| 4 | | | | | | | | |
| 5 | 2 | 60/60 | 5-10 | | 1.0 ppm | Loose, light brown, poorly graded, SAND, some Silty Clumps, sub-angular to sub-rounded, moist (SM). Changing at 8.5 feet to: Loose, brown, well graded, SAND and Gravel, sub-angular to sub-rounded, wet (SW). | 5' SAND (SP) | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | 0.9 ppm | | 8.5' SAND and GRAVEL (GW) | |
| 9 | | | | | | | | |
| 10 | 3 | 60/60 | 10-15 | | 1.0 ppm | Loose, brown, well graded, SAND with Gravel, sub-rounded, wet (SW). | 10' SAND (SW) | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | 0.5 ppm | | | |
| 14 | | | | | | | | |
| 15 | 4 | 60/60 | 15-20 | | 0.7 ppm | Loose, brown, well graded, SAND with Gravel, sub-rounded, wet (SW). | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | 0.7 ppm | | | |
| 19 | | | | | | | | |
| 20 | 5 | 60/60 | 20-25 | | 0.6 ppm | Loose, brown, well graded, SAND, sub-angular, wet (SW). | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | 0.7 ppm | | | |
| 24 | | | | | | | | |
| 25 | 6 | 60/60 | 25-30 | | 0.5 ppm | Loose, brown, well graded, SAND, sub-angular, wet (SW). Changing at 27.0 feet to: Loose, brown, well graded, SAND, with Gravel and Cobble, sub-angular, wet (SW). Changing at 27.6 feet to: Soft, brown, SILT with Sand, wet (ML). Changing at 28.3 feet to: Loose, brown, poorly graded, SAND, little lithics, sub-rounded, wet (SP). | | |
| 26 | | | | | | | | |
| 27 | | | | | | | 27.6' | |
| 28 | | | | | 1.0 ppm | | 28.3' SILT (ML) | |
| 29 | | | | | | | SAND (SP) | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-21D

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-21D
**Page:** 2 **of** 3
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | 7 | 60/60 | 30-35 | | 0.8 ppm | Loose, brown, poorly graded, SAND, trace Gravel, little lithics, sub-angular, wet (SP). | SAND (SP) | | |
| 32 | | | | | | | | | |
| 33 | | | | | 0.6 ppm | | | | |
| 34 | | | | | | | | | |
| 35 | 8 | 60/60 | 35-40 | | 0.4 ppm | Loose, brown, well graded, SAND with Gravel, sub-angular, some lithics, wet (SW). Changing at 37.5 feet to: Stiff, brown, SILT with Sand, trace Gravel, moist (ML). | 35' SAND (SW) | | |
| 36 | | | | | | | | | Grout |
| 37 | | | | | | | 37.5' SILT (ML) | | |
| 38 | | | | | 0.4 ppm 2.0 tsf | | | 2 | |
| 39 | | | | | | | | | |
| 40 | 9 | 60/60 | 40-45 | | 1.3 ppm | Hard, brown, Silty CLAY with Gravel, sub-rounded, becoming more Clay than Silt towards bottom, moist (OL). | 40' CLAY (OL) | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | 1.7 ppm | | | | |
| 44 | | | | | | | | | |
| 45 | 10 | 60/60 | 45-50 | | 1.1 ppm 3.5 tsf | Very stiff, brown, Silty CLAY with Gravel, sub-rounded, trace Sand, moist (CL). | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | 3.9 ppm | | | | |
| 49 | | | | | | | | | |
| 50 | 11 | 60/60 | 50-55 | | 1.1 ppm 0.5 tsf | Soft, brown, Silty CLAY with Gravel, little Sand, sub-rounded, moist (OL). Changing at 51.0 feet to: Very stiff, brown, lean CLAY, trace Gravel, moist (CL). Changing at 53.5 feet to: Stiff, brown, SILT, trace Gravel, moist (ML). | 51' CLAY (CL) | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | 1.3 ppm 3.0 tsf 2.0 tsf | | 53.5' SILT (ML) | | |
| 54 | | | | | | | | | |
| 55 | 12 | 60/60 | 55-60 | | 0.9 ppm >4.0 tsf | Hard, brown, SILT, little Sand, trace Gravel, moist (ML). Changing at 56.8 feet to: Loose, brown, poorly graded SAND, sub-rounded, some lithetics, 2.0 " Cobbles at 58.9 feet, Wet (SP). | | | |
| 56 | | | | | | | 56.8' SAND (SP) | | |
| 57 | | | | | | | | | |
| 58 | | | | | 1.8 ppm | | | | |
| 59 | | | | | | | | | |
| 60 | 13 | 60/60 | 60-65 | | 1.1 ppm | Loose, brown, poorly graded, SAND, trace Gravel, sub-rounded, some lithics, wet (SP). Changing at 64.0 feet to: Hard, dark gray, SILT, trace Gravel, grading to Clay, wet (ML). | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | >4.0 tsf 1.0 ppm | | | | |
| 64 | | | | | | | 64' SILT (SM) 65' | | |

**REMARKS**

2. Pocket penetrometer readings were measured in tons per square foot (tsf) and are used to evaluate consisency of cohesive soil.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-21D

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

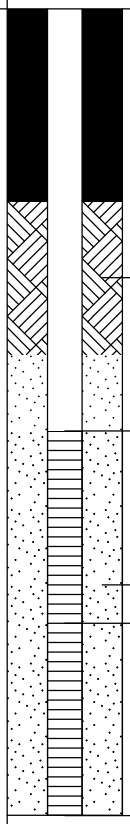
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-21D
**Page:** 3 **of** 3
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample No. | Pen./Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 14 | 60/60 | 65-70 | | 3.0 ppm 3.5 tsf | Very stiff, dark gray, CLAY, trace Gravel, trace Sand, moist (CL). | CLAY (CL) | |
| 66 | | | | | | | | |
| 67 | | | | | | | | |
| 68 | | | | | 1.7 ppm | | | |
| 69 | | | | | | | | |
| 70 | 15 | 60/60 | 70-75 | | 0.3 ppm >4.0 tsf | Hard, dark brown, Clayey Gravel, dark brown, sub-round, moist (GL). | 70' GRAVEL (GL) | |
| 71 | | | | | | | | |
| 72 | | | | | | | | |
| 73 | | | | | 0.7 ppm | | | |
| 74 | | | | | | | | |
| 75 | 16 | 60/60 | 75-80 | | 1.2 ppm >4.0 tsf | Hard, dark brown, lean CLAY, little Gravel, moist (CL). Changing at 79.0 feet to: Very stiff, dark brown, Clayey GRAVEL, some Sand, trace Cobbles, moist (GC). | 75' CLAY (CL) | |
| 76 | | | | | | | | |
| 77 | | | | | | | | |
| 78 | | | | | 1.7 ppm | | | |
| 79 | | | | | | | 79' GRAVEL (GL) | |
| 80 | 17 | 60/60 | 80-85 | | 1.6 ppm | Medium dense, dark brown, Clayey SAND with Gravel, Cobbles at 81.0 feet, moist (SC). | 80' SAND (SC) | |
| 81 | | | | | | | | |
| 82 | | | | | | | | |
| 83 | | | | | 2.3 ppm | | | |
| 84 | | | | | | | | |
| 85 | 18 | 60/60 | 85-90 | | 1.1 ppm | Loose, dark brown, SAND, trace Gravel, wet (SW). Changing at 85.8 feet to: Hard, dark gray, lean CLAY, low plasticity, moist (CL). Changing at 86.6 feet to: Hard, dark red with gray mottles, lean CLAY, small inclusions of white precipitate in gray mottles, possible gypsum Wet (CL). | 85' 85.5 SAND (SW) CLAY (CL) 86.6' CLAY (CL) | |
| 86 | | | | | | | | |
| 87 | | | | | | | | |
| 88 | | | | | 1.0 ppm | | | |
| 89 | | | | | | | | |
| 90 | 19 | 60/60 | 90-95 | | 1.9 ppm | Hard, dark reddish brown with gray mottles, lean CLAY, small inclusions of white precipitate material inclusions, dry to moist (CL). | | |
| 91 | | | | | | | | |
| 92 | | | | | | | | |
| 93 | | | | | 1.3 ppm | | | |
| 94 | | | | | | | | |
| 95 | 20 | 48/48 | 95-99 | | 1.1 ppm >4.0 tsf | Hard, dark reddish brown with gray mottles, lean CLAY, small inclusions of white precipitate material inclusions, dry to moist (CL). | | |
| 96 | | | | | | | | |
| 97 | | | | | | | | |
| 98 | | | | | 1.2 ppm | | | |
| 99 | | | | | | | 99' | |
| | | | | | | Bottom of Borehole at 99.0 Feet | | 3 4 |

**Equipment Installed**




**REMARKS**

3. Groundwater was not encountered during drilling or upon completion.
4. Monitoring well was installed in borehole upon completion. Well screen set from 76.0 to 86.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-21D

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-21M
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:**

**Contractor:** Cascade Drilling
**Foreman:** Jason
**Logged by:** John Morehouse
**Date Start/Finish:** 1-18-18 / 1-18-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | NA | NA |

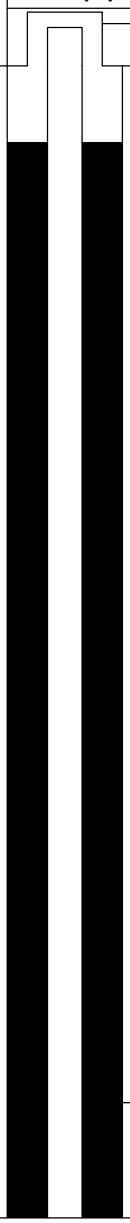
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-21D boring log for sample description and classification. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-21M

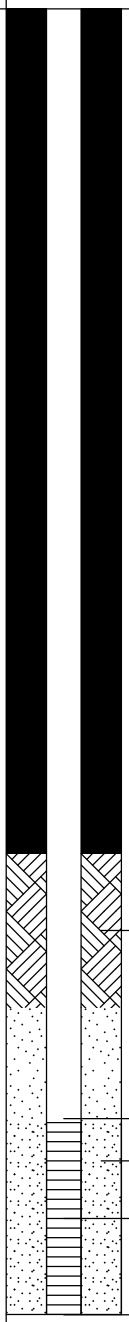
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-21M
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | | | |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | Bottom of Borehole at 64.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 59.0 to 64.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-21M

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
Packer Drive
Plainfield, Michigan

**Boring No.:** MW-21S
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:**

**Contractor:** Cascade Drilling
**Foreman:** Jason
**Logged by:** John Morehouse
**Date Start/Finish:** 1-18-18 / 1-18-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | NA | NA |

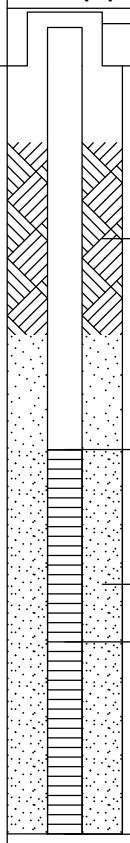
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–19 | | | | | | See MW-21D boring log for sample description and classification. | | |
| 20–29 | | | | | | Bottom of Borehole at 20.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 10.0 to 20.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-21S

BORING_WELL 6233552 WWW PACKER DR_PLAINFIELD MI.GPJ GZA_CORP.GDT 1/25/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23A
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** S. Stephenson
**Date Start/Finish:** 6-20-19 / 6-20-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

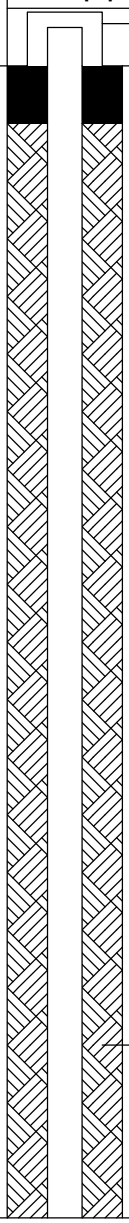
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NA | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | SeeHS-MW-23D boring log for sample description and classification. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-23A

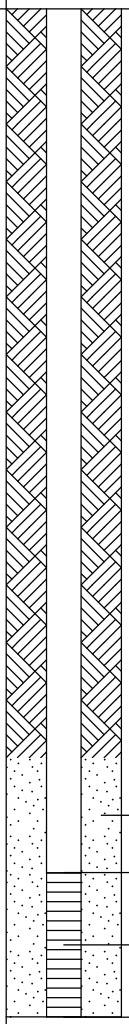
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23A
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | | | |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |
| 65 | | | | | | | | |
| 66 | | | | | | | | |
| 67 | | | | | | | | |
| 68 | | | | | | | | |
| 69 | | | | | | | | |
| 70 | | | | | | | | |
| 71 | | | | | | | | |
| 72 | | | | | | | | |
| 73 | | | | | | | | |
| 74 | | | | | | | | |
| 75 | | | | | | Bottom of Borehole at 75.0 Feet | | 1 |
| 76 | | | | | | | | |
| 77 | | | | | | | | |
| 78 | | | | | | | | |
| 79 | | | | | | | | |
| 80 | | | | | | | | |
| 81 | | | | | | | | |
| 82 | | | | | | | | |
| 83 | | | | | | | | |
| 84 | | | | | | | | |
| 85 | | | | | | | | |
| 86 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 70.0 to 75.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23B
**Page:** 1 **of** 3
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 7-31-19 / 8-1-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

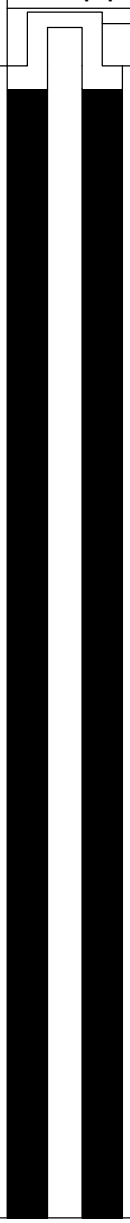
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | SeeHS-MW-23D boring log for sample description and classification. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23B
**Page:** 2 **of** 3
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | Bentonite / Grout |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

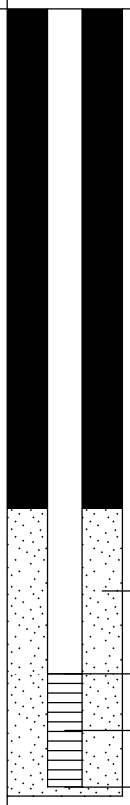
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23B
**Page:** 3 **of** 3
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 109–142 | | | | | | | | |
| 143 | | | | | | Bottom of Borehole at 142.5 Feet | | 1 |
| 144–166 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 137.2 to 142.1 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23C
**Page:** 1 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 7-30-19 / 7-31-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

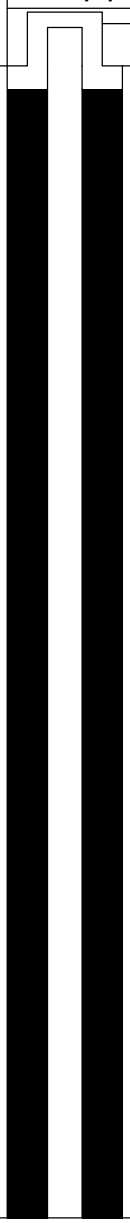
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | SeeHS-MW-23D boring log for sample description and classification. | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-23C

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23C
**Page:** 2 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | | | | Bentonite / Grout |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-23C

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23C
**Page:** 3 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 109 | | | | | | | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | | | | | | | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | |
| 119 | | | | | | | | | |
| 120 | | | | | | | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | |
| 123 | | | | | | | | | |
| 124 | | | | | | | | | |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | | | | | | | | | |
| 130 | | | | | | | | | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | | | | | | | | | |
| 135 | | | | | | | | | |
| 136 | | | | | | | | | |
| 137 | | | | | | | | | |
| 138 | | | | | | | | | |
| 139 | | | | | | | | | |
| 140 | | | | | | | | | |
| 141 | | | | | | | | | |
| 142 | | | | | | | | | |
| 143 | | | | | | | | | |
| 144 | | | | | | | | | |
| 145 | | | | | | | | | |
| 146 | | | | | | | | | |
| 147 | | | | | | | | | |
| 148 | | | | | | | | | |
| 149 | | | | | | | | | |
| 150 | | | | | | | | | |
| 151 | | | | | | | | | |
| 152 | | | | | | | | | |
| 153 | | | | | | | | | |
| 154 | | | | | | | | | |
| 155 | | | | | | | | | |
| 156 | | | | | | | | | |
| 157 | | | | | | | | | |
| 158 | | | | | | | | | |
| 159 | | | | | | | | | |
| 160 | | | | | | | | | |
| 161 | | | | | | | | | |
| 162 | | | | | | | | | |
| 163 | | | | | | | | | |
| 164 | | | | | | | | | |
| 165 | | | | | | | | | |
| 166 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-23C

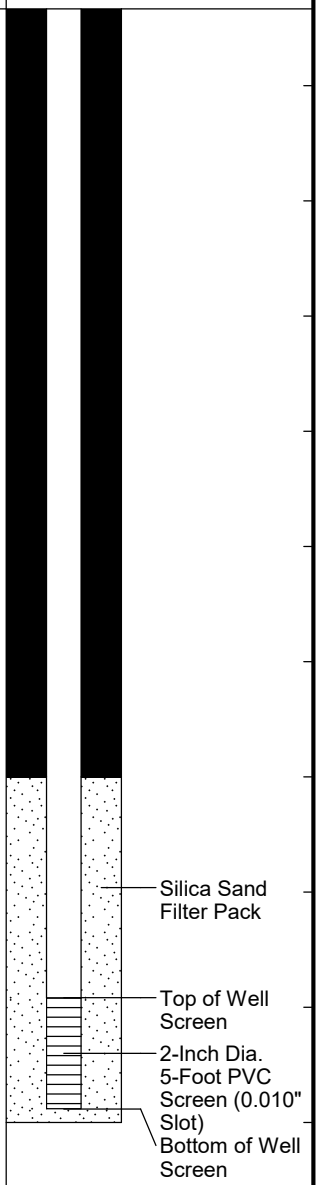
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23C
**Page:** 4 **of** 4
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 168–214 | | | | | | | | |
| 215 | | | | | | Bottom of Borehole at 215 Feet | | 1 |
| 216–224 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 209.6 to 214.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-23C

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 1 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** S. Stephenson
**Date Start/Finish:** 6-10-19 / 6-18-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

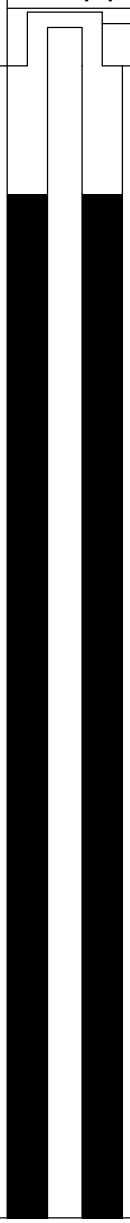
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NA | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/24 | 0-2 | 3-4 5-7 | | TOPSOIL, dry. Changing at 0.4 feet to: Loose, tan, fine SAND, little Silt, moist. | 0.4' TOPSOIL; SAND | |
| 1 | | | | | | | | |
| 2 | 2 | 24/24 | 2-4 | 3-5 8-11 | | Loose, tan, fine SAND, little Silt, moist. Changing at 3.0 feet to: Medium dense, tan, fine to medium SAND, trace, Silt, moist. | | |
| 3 | | | | | | | | |
| 4 | 3 | 24/24 | 4-6 | 1-4 5-7 | | Medium dense, tan, fine to medium SAND, trace, Silt, moist. Changing at 5.3 feet to: Stiff, brown, CLAY & SILT, trace fine Sand, dry. | 4.8' CLAY & SILT | |
| 5 | | | | | | | | |
| 6 | 4 | 24/20 | 6-8 | 2-6 7-6 | | Medium dense, tan, fine to medium SAND, trace Silt, moist. | 6' SAND | |
| 7 | | | | | | | | |
| 8 | 5 | 24/12 | 8-10 | 5-6 5-5 | | Medium dense, tan, fine to medium SAND, trace Silt, moist. | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/12 | 10-12 | 3-4 4-6 | | Medium dense, tan, fine to medium SAND, trace Silt, moist. | | 1 |
| 11 | | | | | | | | |
| 12 | 7 | 24/12 | 12-14 | 7-4 4-2 | | Medium dense, tan, fine to medium SAND, trace Silt, moist. | | |
| 13 | | | | | | | | |
| 14 | 8 | 24/12 | 14-16 | 2-4 3-3 | | Loose, brown, fine to medium SAND, little Silt, wet. | | 2 |
| 15 | | | | | | | | |
| 16 | 9 | 24/15 | 16-18 | 5-1 1-2 | | Loose, brown, fine to medium SAND, little Silt, wet. Changing at 16.4 feet to: Loose, brown, SILT, wet. Changing at 16.6 feet to: Loose, brown, fine to medium SAND, wet. Changing at 17.6 feet to: Brown, Silty CLAY, | 16.4' 16.6' SILT; SAND; 17.6' 17.8' Silty CLAY | |
| 17 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Temporary well set at 10.0 to 20.0 feet below ground surface. Purged 15.0 gallons. Groundwater sample submitted for laboratory analysis.
2. Groundwater was encountered at approximately 14.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 2 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 10 | 24/20 | 18-20 | 3-2<br>1-1 | | wet. Changing at 17.8 feet to: Brown, fine to coarse SAND, some Silt, wet.<br>Brown, fine to coarse SAND, some Silt, trace fine Gravel, wet. | SAND | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/19 | 20-22 | 1-1<br>1-3 | | Brown, fine to coarse SAND, some Silt, trace fine Gravel, wet. Changing at 21.5 feet to: Brown, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, dry. | 21.4'<br>CLAY & SILT | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/20 | 22-24 | 8-4<br>5-6 | | Brown, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, dry (wet on outside). | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/19 | 24-26 | 3-4<br>5-6 | | Brown, CLAY & SILT, little fine to coarse Sand, trace fine Gravel, dry (wet on outer layer). | | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/0 | 26-28 | 7-8<br>12-13 | | NO RECOVERY. | 26'<br>NO RECOVERY | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/20 | 28-30 | 4-7<br>7-7 | | Stiff, brown, CLAY & SILT, little fine to medium Sand, dry (wet on outer layer). | 28'<br>CLAY & SILT | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/12 | 30-32 | 6-6<br>10-10 | | Stiff, brown, CLAY & SILT, little fine to medium Sand, dry (wet on outer layer). | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/17 | 32-34 | 4-5<br>7-8 | | Stiff, brown, CLAY & SILT, little fine to medium Sand, dry (wet on outer layer). Changing at 33.0 feet to: Brown, fine to medium SAND, little Silt, trace fine Gravel, wet. | 32.4'<br>SAND | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/6 | 34-36 | 10-16<br>18-24 | | Brown, CLAY & SILT, some fine to medium Sand, wet. | 34'<br>CLAY & SILT | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/24 | 36-38 | 3-5<br>9-12 | | Stiff, brown, CLAY & SILT, some fine to medium Sand, trace fine Gravel (wet on outer layer). | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/12 | 38-40 | 7-10<br>17-14 | | Stiff, brown, CLAY & SILT, some fine to medium Sand, trace fine Gravel (wet on | 38.7'<br>SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 3 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | outer layer). Changing at 38.7 feet to: Light brown, fine to medium SAND, little Silt, trace fine Gravel, moist to dry. | SAND | | |
| 40 | 21 | 24/12 | 40-42 | 10-22<br>22-29 | | Light brown, fine to medium SAND, little Silt, trace fine Gravel, dry. | | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/12 | 42-44 | 19-21<br>22-20 | | Very dense, light brown, fine to medium SAND, trace Silt, dry. | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/12 | 44-46 | 9-15<br>21-21 | | Very dense, brown, fine SAND, little Silt, moist. | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/12 | 46-48 | 12-14<br>21-18 | | Very dense, brown, fine SAND, little Silt, moist. | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/17 | 48-50 | 22-43-50/5" | | Very dense, brown, fine SAND, little Silt, moist (sluff). | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/12 | 50-52 | 13-24<br>24-42 | | Very dense, light brown, fine to coarse SAND, some fine to coarse Gravel, little Silt & Clay, dry with large clumps of Clay. | | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/12 | 52-54 | 11-18<br>27-29 | | Very dense, light brown, fine to coarse SAND, some fine to coarse Gravel, little Silt & Clay, dry, with Clay lenses from 6.0 to 6.9" feet and wet. | | | |
| 53 | | | | | | | | | |
| 54 | 28 | 24/12 | 54-56 | 12-20<br>23-30 | | Very dense, light brown, fine to coarse SAND, some fine to coarse Gravel, little Silt & Clay, dry. Changing at 54.2 feet to: Light brown, CLAY, dry. Changing at 54.7 feet to: Light brown, fine to coarse SAND, some Clay, dry.Changing at 54.8 feet to: Tan, fine to coarse SAND, trace Silt, dry. | | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/8 | 56-58 | 29-21<br>17-19 | | Tan, fine to coarse SAND, trace Silt, dry. | | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24/12 | 58-60 | 7-11<br>16-17 | | Tan, fine to coarse SAND, trace Silt, dry. | | | |
| 59 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 4 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 31 | 24/12 | 60-62 | 18-17 16-19 | | Tan, fine to coarse SAND, trace Silt, dry. | SAND | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/19 | 62-64 | 6-12 13-17 | | Tan, fine to coarse SAND, trace Silt, dry. | | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/18 | 64-66 | 8-14 19-22 | | Dense, tan, fine to coarse SAND, trace Silt, moist. | | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/17 | 66-68 | 5-11 12-13 | | Dense, tan, fine to coarse SAND, trace Silt, moist. | | | |
| 67 | | | | | | | | | |
| 68 | 35 | 24/2 | 68-70 | 8-15 18-17 | | Dense, tan, fine to medium SAND, trace Silt, moist. | | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/20 | 70-72 | 8-8 9-10 | | Medium dense, tan, fine to medium SAND, little Silt, wet. | | 3 | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/20 | 72-74 | 5-7 12-10 | | Medium dense, gray and light brown, fine to coarse SAND, trace Silt, wet. | | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/22 | 74-76 | 8-10 13-15 | | Medium dense, gray and light brown, fine to coarse SAND, trace Silt, wet. | | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/12 | 76-78 | 6-13 18-24 | | Medium dense, gray and light brown, fine to coarse SAND, trace Silt, wet. | | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/24 | 78-80 | 9-17 24-30 | | Medium dense, gray and light brown, fine to coarse SAND, trace Silt, wet. | | | |
| 79 | | | | | | | | | |
| 80 | 41 | 24/20 | 80-82 | 3-13 24-31 | | Medium dense, gray and light brown, fine to coarse SAND, trace Silt, wet. | | 4 5 | |

**REMARKS**

3. Temporary well set at 70.0 to 80.0 feet below ground surface. Purged 35.0 gallons. Groundwater sample submitted for laboratory analysis.
4. 2.0 inch sampler used from 80.0 to 82.0 feet.
5. Temporary well set at 80.0 to 90.0 feet below ground surface. Purged 35.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL 62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 5 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 82 | 42 | 24/18 | 82-84 | 5-6<br>10-10 | | Medium dense, gray and light brown, fine to coarse SAND, trace Silt, wet. | | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/12 | 84-86 | 2-5<br>10-14 | | Medium dense, gray and light brown, fine SAND, trace Silt, wet. | | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/20 | 86-88 | 3-6<br>14-15 | | Medium dense, gray and light brown, fine SAND, trace Silt, wet. | | | |
| 87 | | | | | | | | | |
| 88 | 45 | 24/20 | 88-90 | 2-4<br>7-8 | | Medium dense, gray and light brown, fine SAND, trace Silt, wet. | | | |
| 89 | | | | | | | | | |
| 90 | 46 | 24/12 | 90-92 | 1-2<br>5-6 | | Medium dense, gray and light brown, fine SAND, trace Silt, wet. | | 6 | |
| 91 | | | | | | | | | |
| 92 | 47 | 24/5 | 92-94 | 3-3<br>6-6 | | Medium dense, gray and light brown, fine SAND, trace Silt, wet. | | | |
| 93 | | | | | | | | | |
| 94 | 48 | 24/20 | 94-96 | 6-2<br>4-8 | | Medium dense, gray and light brown, fine SAND, trace Silt, wet. | | | |
| 95 | | | | | | | | | |
| 96 | 49 | 24/20 | 96-98 | 3-2<br>7-13 | | Medium dense, gray and light brown, fine SAND, trace Silt, wet. | | | |
| 97 | | | | | | | | | |
| 98 | 50 | 24/20 | 98-100 | 2-2<br>5-10 | | Loose, brown, fine SAND, trace Silt, wet. | | | |
| 99 | | | | | | | | | |
| 100 | 51 | 24/20 | 100-102 | 1-2<br>3-5 | | Loose, brown, fine SAND, trace Silt, wet. | | 7 | |
| 101 | | | | | | | | | |

**REMARKS**

6. Temporary well set at 90.0 to 100.0 feet below ground surface. Purged 40.0 gallons. Groundwater sample submitted for laboratory analysis.
7. Temporary well set at 100.0 to 110.0 feet below ground surface. Purged 40.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 6 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 52 | 24/8 | 102-104 | 1-2<br>3-5 | | Loose, brown, fine SAND, trace Silt, wet. | SAND | | |
| 103 | | | | | | | | | |
| 104 | 53 | 24/12 | 104-106 | 1-1<br>4-7 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 105 | | | | | | | | | |
| 106 | 54 | 24/12 | 106-108 | 1-1<br>7-11 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24/20 | 108-110 | 1-2<br>4-5 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 109 | | | | | | | | | |
| 110 | 56 | 24/7 | 110-112 | 1-1<br>3-6 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | 8 | |
| 111 | | | | | | | | | |
| 112 | 57 | 24/12 | 112-114 | 3-10<br>17-11 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 113 | | | | | | | | | |
| 114 | 58 | 24/12 | 114-116 | 1-2<br>5-9 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 115 | | | | | | | | | |
| 116 | 60 | 24/15 | 116-118 | 3-7<br>12-10 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | Bentonite/Grout |
| 117 | | | | | | | | | |
| 118 | 61 | 24/8 | 118-120 | 2-3<br>7-8 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 119 | | | | | | | | | |
| 120 | 62 | 24/5 | 120-122 | 2-4<br>5-6 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | 9 | |
| 121 | | | | | | | | | |
| 122 | 63 | 24/8 | 122-124 | 1-1<br>2-1 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |

**REMARKS**

8. Temporary well set at 110.0 to 120.0 feet below ground surface. Purged 40.0 gallons. Groundwater sample submitted for laboratory analysis.
9. Temporary well set at 120.0 to 130.0 feet below ground surface. Purged 40.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 7 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 124 | 64 | 24/14 | 124-126 | 1-1<br>3-4 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 125 | | | | | | | | | |
| 126 | 65 | 24/8 | 126-128 | 1-2<br>3-6 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 127 | | | | | | | | | |
| 128 | 66 | 24/8 | 128-130 | 1-4<br>3-5 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | | |
| 129 | | | | | | | | | |
| 130 | 67 | 24/1 | 130-132 | 1-1<br>5-5 | | Loose, tan, fine to medium SAND, trace Silt, wet. | | 10 | |
| 131 | | | | | | | | | |
| 132 | 68 | 24/0 | 132-134 | 1-2<br>2-3 | | NO RECOVERY. | 132'<br>NO RECOVERY | | |
| 133 | | | | | | | | | |
| 134 | 70 | 24/6 | 134-136 | 1-3<br>4-5 | | Loose, brown, fine to medium SAND, trace Silt, wet. | 134'<br>SAND | | |
| 135 | | | | | | | | | |
| 136 | 71 | 24/12 | 136-138 | 1-1<br>3-4 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 137 | | | | | | | | | |
| 138 | 72 | 24/12 | 138-140 | 1-4<br>4-7 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 139 | | | | | | | | | |
| 140 | 73 | 24/20 | 140-142 | 4-4<br>6-7 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | 11 | |
| 141 | | | | | | | | | |
| 142 | 74 | 24/20 | 142-144 | 3-7<br>13-8 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 143 | | | | | | | | | |

**REMARKS**

10. Temporary well set at 130.0 to 140.0 feet below ground surface. Purged 45.0 gallons. Groundwater sample submitted for laboratory analysis.
11. Temporary well set at 140.0 to 150.0 feet below ground surface. Purged 45.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-23D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 8 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 75 | 24/20 | 144-146 | 2-2<br>2-4 | | Loose, brown, fine to medium SAND, trace Silt, wet. | SAND | | |
| 145 | | | | | | | | | |
| 146 | 76 | 24/18 | 146-148 | 0-2<br>3-5 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 147 | | | | | | | | | |
| 148 | 77 | 24/20 | 148-150 | 1-2<br>4-5 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 149 | | | | | | | | | |
| 150 | 78 | 24/20 | 150-152 | 1-3<br>7-11 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | 12 | |
| 151 | | | | | | | | | |
| 152 | 79 | 24/10 | 152-154 | 3-3<br>7-7 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 153 | | | | | | | | | |
| 154 | 80 | 24/6 | 154-156 | 2-3<br>5-6 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 155 | | | | | | | | | |
| 156 | 81 | 24/10 | 156-158 | 4-9<br>12-10 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 157 | | | | | | | | | |
| 158 | 82 | 24/3 | 158-160 | 3-6<br>6-9 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 159 | | | | | | | | | |
| 160 | 83 | 24/5 | 160-162 | 1-1<br>5-5 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | 13 | |
| 161 | | | | | | | | | |
| 162 | 84 | 24/2 | 162-164 | 6-11<br>12-13 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 163 | | | | | | | | | |
| 164 | 85 | 24/5 | 164-166 | 1-2<br>5-7 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |

**REMARKS**

12. Temporary well set at 150.0 to 160.0 feet below ground surface. Purged 40.0 gallons. Groundwater sample submitted for laboratory analysis.
13. Temporary well set at 160.0 to 170.0 feet below ground surface. Purged 70.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 9 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 166 | 86 | 24/6 | 166-168 | 2-7<br>9-8 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 167 | | | | | | | | | |
| 168 | 87 | 24/12 | 168-170 | 2-3<br>7-8 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 169 | | | | | | | | | |
| 170 | 88 | 24/1 | 170-172 | 1-2<br>3-3 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | 14 | |
| 171 | | | | | | | | | |
| 172 | 90 | 24/12 | 172-174 | 1-1<br>4-4 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 173 | | | | | | | | | |
| 174 | 91 | 24 | 174-176 | 3-7<br>10-12 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 175 | | | | | | | | | |
| 176 | 92 | 24/12 | 176-178 | 5-9<br>12-13 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 177 | | | | | | | | | |
| 178 | 93 | 24/12 | 178-180 | 1-1<br>3-8 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 179 | | | | | | | | | |
| 180 | 94 | 24/12 | 180-182 | 2-4<br>6-7 | | Loose, brown, fine to medium SAND, trace Silt, wet. Changing at 181.9 feet to: Brown, fine to coarse SAND, trace Silt,wet. | | 15 | |
| 181 | | | | | | | | | |
| 182 | 95 | 24/21 | 182-184 | 5-10<br>10-11 | | Medium dense, brown, fine to coarse SAND, trace Silt, wet. Changing at 183.8 feet to: Medium dense, brown, fine to coarse SAND, some fine Gravel, trace Silt, wet. | | | |
| 183 | | | | | | | | | |
| 184 | 96 | 24/12 | 184-186 | 4-7<br>8-11 | | Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 185 | | | | | | | | | |

**REMARKS**

14. Temporary well set at 170.0 to 180.0 feet below ground surface. Purged 80.0 gallons. Groundwater sample submitted for laboratory analysis.
15. Temporary well set at 180.0 to 190.0 feet below ground surface. Purged 100.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 10 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 97 | 24/12 | 186-188 | 3-6<br>8-11 | | Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | SAND | | |
| 187 | | | | | | | | | |
| 188 | 98 | 24/4 | 188-190 | 3-5<br>6-8 | | Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 189 | | | | | | | | | |
| 190 | 99 | 24/1 | 190-192 | 1-2<br>3-7 | | Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | 16 | |
| 191 | | | | | | | | | |
| 192 | 100 | 24/8 | 192-194 | 2-3<br>5-8 | | Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 193 | | | | | | | | | |
| 194 | 101 | 24/10 | 194-196 | 2-13<br>27-31 | | Medium dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 195 | | | | | | | | | |
| 196 | 102 | 24/18 | 196-198 | 0-12<br>28-21 | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 197 | | | | | | | | | |
| 198 | 104 | 24/0 | 198-200 | 3-20-50/5' | | NO RECOVERY. | 198'<br>NO RECOVERY | | |
| 199 | | | | | | | | | |
| 200 | 105 | 24/10 | 200-202 | 8-20-50/5" | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | 200'<br>SAND | 17 | |
| 201 | | | | | | | | | |
| 202 | 106 | 24/6 | 202-204 | 18-50/5" | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 203 | | | | | | | | | |
| 204 | 107 | 24/7 | 204-206 | 3-30-50/4" | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 205 | | | | | | | | | |
| 206 | 108 | 24/0 | 206-208 | 3-6<br>11-18 | | NO RECOVERY. | 206'<br>NO RECOVERY | | |

**REMARKS**

16. Temporary well set at 190.0 to 200.0 feet below ground surface. Purged 100.0 gallons. Groundwater sample submitted for laboratory analysis.
17. Temporary well set at 200.0 to 210.0 feet below ground surface. Purged 100.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 11 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NO RECOVERY | | |
| 208 | 109 | 24/12 | 208-210 | 0-6 27-50/4" | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | 208' SAND | | |
| 209 | | | | | | | | | |
| 210 | 110 | 24/4 | 210-212 | 3-13 26-22 | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | 18 | |
| 211 | | | | | | | | | |
| 212 | 111 | 24/0 | 212-214 | 6-11 18-26/3" | | NO RECOVERY. | 212' NO RECOVERY | | |
| 213 | | | | | | | | | |
| 214 | 112 | 24/10 | 214-216 | 6-23-50/4" | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | 214' SAND | | |
| 215 | | | | | | | | | |
| 216 | 113 | 24/0 | 216-218 | 4-16 31-29/2" | | NO RECOVERY. | 216' NO RECOVERY | | |
| 217 | | | | | | | | | |
| 218 | 114 | 24/0 | 218-220 | 19-50/3" | | NO RECOVERY with some fine to medium SAND in bailer. | | | |
| 219 | | | | | | | | | |
| 220 | 115 | 24/18 | 220-222 | 9-22 24-25 | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | 220' SAND | | |
| 221 | | | | | | | | | |
| 222 | 116 | 24/8 | 222-224 | 4-10 20-28 | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 223 | | | | | | | | | |
| 224 | 117 | 24/20 | 224-226 | 10-25 37-50/5" | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 225 | | | | | | | | | |
| 226 | 118 | 24/6 | 226-228 | 12-44/5" | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 227 | | | | | | | | | |

**REMARKS**

18. Temporary well set at 210.0 to 220.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

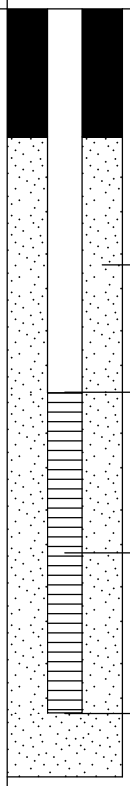
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-23D
**Page:** 12 **of** 12
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 119 | 24/6 | 228-230 | 44-6" | | Dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | SAND | |
| 229 | | | | | | | | |
| 230 | 120 | 24/6 | 230-232 | 19-39/4" | | Very dense, brown, fine to coarse SAND, trace Silt, trace Gravel, wet. | | 19 |
| 231 | | | | | | | | |
| 232 | | | | | | | | |
| 233 | | | | | | | | |
| 234 | | | | | | | | |
| 235 | | | | | | | | |
| 236 | 121 | 24/11 | 236-238 | 20-36/5" | | Very dense, brown, fine to coarse SAND, trace Silt, trace Gravel, wet. | | |
| 237 | | | | | | | | |
| 238 | 122 | 24/24 | 238-240 | 0-11 19-26 | | Very dense, brown, fine to coarse SAND, trace Silt, trace Gravel, wet. Changing at 238.8 feet to: Very stiff, Clayey SILT, little fine Sand, dry. | 238.8' Clayey SILT | |
| 239 | | | | | | | | |
| 240 | | | | | | Bottom of Borehole at 240.0 Feet | 240' | 20 |
| 241 | | | | | | | | |
| 242 | | | | | | | | |
| 243 | | | | | | | | |
| 244 | | | | | | | | |
| 245 | | | | | | | | |
| 246 | | | | | | | | |
| 247 | | | | | | | | |
| 248 | | | | | | | | |

**Equipment Installed**




**REMARKS**

19. Temporary well set at 230.0 to 240.0 feet below ground surface. Purged 100.0 gallons. Groundwater sample submitted for laboratory analysis.
20. Monitoring well was installed in borehole upon completion. Well screen set from 234.0 to 239.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24A
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Christine Cano
**Date Start/Finish:** 10-1-19 / 10-2-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

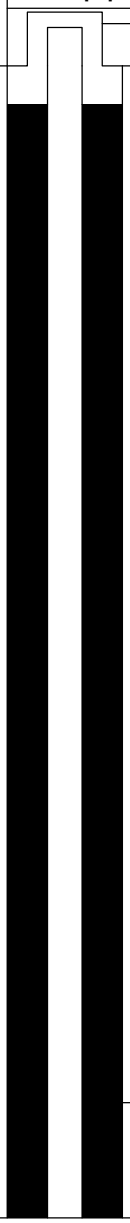
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-24D for detailed soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

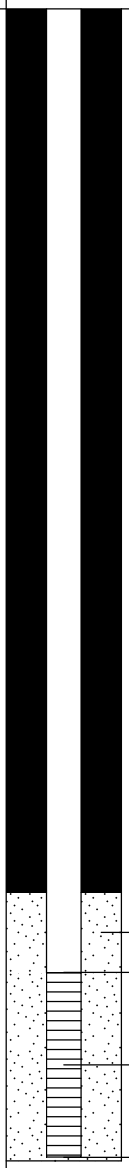
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24A
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | Bottom of Borehole at 60.0 Feet | | 1 |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well HS-MW-24A was installed in borehole upon completion. Well screen set from approximately 55.1 to 59.9 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-24A

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24B
**Page:** 1 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Christine Cano/John Morehouse
**Date Start/Finish:** 9-23-19 / 10-1-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

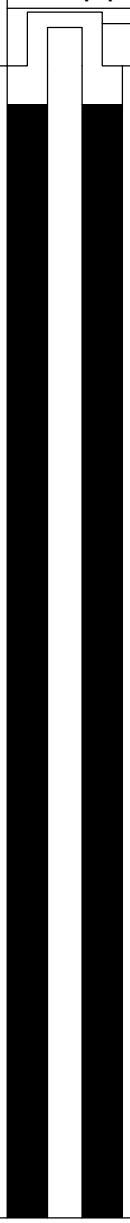
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/16 | 0-2 | 1-1 1-2 | 0.0 ppm | Very loose, brown, fine SAND, some Silt, moist. Changing at 0.3 feet to: Very loose, light brown to tan, fine SAND, trace Silt, moist. | SAND | 1 |
| 2 3 | 2 | 24/16 | 2-4 | 2-2 3-8 | 0.0 ppm | Loose, light tan, very fine SAND, trace Silt, moist. | | |
| 4 5 | 3 | 24/20 | 4-6 | 9-10 12-9 | 0.0 ppm | Medium dense, light tan, very fine SAND and SILT, moist. | | |
| 6 7 | 4 | 24/24 | 6-8 | 5-7 10-10 | 0.0 ppm | Medium dense, light brown, fine SAND, trace Clay, moist. | | |
| 8 9 | 5 | 24/24 | 8-10 | 7-12 13-12 | 0.0 ppm | Medium dense, light brown, fine SAND, trace Clay, moist. | | |
| 10 11 | 6 | 24/24 | 10-12 | 6-3 4-4 | 0.0 ppm | Loose, light brown, fine SAND, trace Clay, moist. Changing at 11.0 feet to: Loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 12 13 | 7 | 24/12 | 12-14 | 1-3 2-2 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, moist. | | |
| 14 15 | 8 | 24/20 | 14-16 | 2-3 4-5 | 0.0 ppm | Loose, brown, fine SAND, trace Clay, moist. Changing at 15.0 feet to: Loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 16 17 | 9 | 24/10 | 16-18 | 3-6 5-4 | 0.0 ppm | Medium dense, tan, fine to medium SAND, trace Silt, moist. | | |
| 18 19 | 10 | 24/12 | 18-20 | 2-3 3-2 | 0.0 ppm | Loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 20 21 | 11 | 24/14 | 20-22 | 1-2 2-3 | 0.0 ppm | Very loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 22 23 | 12 | 24/14 | 22-24 | 1-2 2-3 | 0.0 ppm | Very loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 24 25 | 13 | 24/14 | 24-26 | 3-4 4-4 | 0.0 ppm | Loose, light tan, fine to medium SAND, trace Silt, moist. | | |
| 26 27 | 14 | 24/14 | 26-28 | 1-3 3-3 | 0.0 ppm | Loose, light tan, fine to medium SAND, trace Silt, moist. | | |
| 28 29 | 15 | 24/20 | 28-30 | 1-4 3-3 | 0.0 ppm | Loose, light tan, fine to medium SAND, trace Silt, moist. | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24B
**Page:** 2 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | 16 | 24/19 | 30-32 | 3-2 3-4 | 0.0 ppm | Loose, light tan, fine to medium SAND, trace Silt, moist. | SAND | | |
| 32 33 | 17 | 24/14 | 32-34 | 4-5 7-4 | 0.0 ppm | Medium dense, light tan, fine to medium SAND, trace Silt, moist. | | | |
| 34 35 | 18 | 24/22 | 34-36 | 4-5 7-8 | 0.0 ppm | Medium dense, light tan, fine to medium SAND, trace Silt, trace Gravel, moist. | | | |
| 36 37 | 19 | 24/17 | 36-38 | 4-5 5-6 | 0.0 ppm | Loose, tan, fine to medium SAND, trace Silt, moist. Changing at 37.5 feet to: Loose, tan, fine to coarse SAND, trace Silt, moist. | | | |
| 38 39 | 20 | 24/16 | 38-40 | 5-7 7-9 | 0.0 ppm | Medium dense, tan, fine to coarse SAND, trace Silt, moist. | | | |
| 40 41 | 21 | 24/14 | 40-42 | 4-7 7-9 | 0.0 ppm | Medium dense, tan, Silty fine to medium SAND, trace Gravel, moist. | | | |
| 42 43 | 22 | 24/13 | 42-44 | 5-9 9-10 | 0.0 ppm | Medium dense, tan, Silty fine to coarse SAND, some Gravel, moist. | | | |
| 44 45 | 23 | 24/5 | 44-46 | 6-10 20-20 | 0.0 ppm | Medium dense, tan, Silty fine to coarse SAND, trace Gravel, moist. | | | |
| 46 47 | 24 | 24/12 | 46-48 | 5-16 33-16 | 0.0 ppm | Dense, tan, Sandy GRAVEL, trace Silt, moist. | 46' GRAVEL | | |
| 48 49 | 25 | 24/4 | 48-50 | 11-23 21-13 | 0.0 ppm | Dense, tan, Sandy GRAVEL, trace Silt, moist. | | | |
| 50 51 | 26 | 24/0 | 50-52 | 17-11 10-9 | | NO RECOVERY. | 50' NO RECOVERY | | |
| 52 53 | 27 | 24/1 | 52-54 | 18-15 12-9 | 0.0 ppm | Medium dense, tan, coarse SAND, wet. | 52' SAND | 2 | |
| 54 55 | 28 | 24/4 | 54-56 | 15-9 7-7 | 0.0 ppm | Medium dense, tan, fine to coarse SAND, trace Gravel, wet. | | 3 | |
| 56 57 | 29 | 24/18 | 56-58 | 2-2 2-4 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 58 59 | 30 | 24/17 | 58-60 | 1-1 2-3 | 0.0 ppm | Very loose, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 60 61 | 31 | 24/0 | 60-62 | 1-2 4-6 | | NO RECOVERY. | 60' NO RECOVERY | | |
| 62 63 | 32 | 24/5 | 62-64 | 2-2 4-4 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. | 62' SAND | | |
| 64 | 33 | 24/8 | 64-66 | 3-3 4-5 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, | | | |

**REMARKS**

2. Groundwater was encountered at approximately 52.0 feet below ground surface.
3. Temporary well set at 55.0 to 60.0 feet below ground surface. Purged 70.0 gallons. Groundwater sample submitted for laboratory analysis.
4. Temporary well set at 65.0 to 70.0 feet below ground surface. Purged 35.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24B
**Page:** 3 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | wet. | SAND | 4 | |
| 66–67 | 34 | 24/14 | 66-68 | 1-2 2-3 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 68–69 | 35 | 24/14 | 68-70 | 1-2 3-10 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 70–71 | 36 | 24/24 | 70-72 | 7-9 10-12 | 0.0 ppm | Medium dense, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 72–73 | 37 | 24/15 | 72-74 | 4-3 2-2 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. Changing at 73.5 feet to: Loose, brown, Sandy GRAVEL, wet. | 73.5' 74' GRAVEL | | |
| 74–75 | 38 | 24/14 | 74-76 | 6-8 8-8 | 0.0 ppm | Medium dense, brown, fine to coarse SAND and Gravel, trace Silt, wet. | SAND | 5 | |
| 76–77 | 39 | 24/2 | 76-78 | 2-3 3-4 | 0.0 ppm | Loose, brown, fine to coarse SAND and Gravel, trace Silt, wet. | | | |
| 78–79 | 40 | 24/14 | 78-80 | 4-5 5-5 | 0.0 ppm | Medium dense, brown to gray, GRAVEL, some fine to coarse Sand, wet. | 78' GRAVEL | | |
| 80–81 | 41 | 24/3 | 80-82 | 5-5 5-7 | 0.0 ppm | Medium dense, brown to gray, GRAVEL, some fine to coarse Sand, wet. | | | |
| 82–83 | 42 | 24/16 | 82-84 | 2-3 4-4 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | 82' SAND | | |
| 84–85 | 43 | 24/24 | 84-86 | 2-2 2-4 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | 6 | |
| 86–87 | 44 | 24/16 | 86-88 | 2-1 2-2 | 0.0 ppm | Very loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 88–89 | 45 | 24/12 | 88-90 | 3-3 3-5 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 90–91 | 46 | 24/8 | 90-92 | 2-3 6-7 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 92–93 | 47 | 24/16 | 92-94 | 1-1 2-3 | 0.0 ppm | Very loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 94–95 | 48 | 24/7 | 94-96 | 1-2 3-4 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | 7 | |
| 96–97 | 49 | 24/20 | 96-98 | 2-2 5-6 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 98–99 | 50 | 24/16 | 98-100 | 4-2 4-5 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |

**REMARKS**

5. Temporary well set at 75.0 to 80.0 feet below ground surface. Purged 45.0 gallons. Groundwater sample submitted for laboratory analysis.
6. Temporary well set at 85.0 to 90.0 feet below ground surface. Purged 75.0 gallons. Groundwater sample submitted for laboratory analysis.
7. Temporary well set at 95.0 to 100.0 feet below ground surface. Purged 90.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24B
**Page:** 4 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 51 | 24/10 | 100-102 | 3-7 11-13 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | SAND | | |
| 101 | | | | | | | | | |
| 102 | 52 | 24/12 | 102-104 | 2-2 3-7 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 103 | | | | | | | | | |
| 104 | 53 | 24/10 | 104-106 | 3-4 5-7 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 105 | | | | | | | | 8 | |
| 106 | 54 | 24/14 | 106-108 | 3-9 10-10 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24/16 | 108-110 | 2-4 8-9 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 109 | | | | | | | | | |
| 110 | 56 | 24/3 | 110-112 | 3-7 9-11 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | Bentonite Slurry / Grout |
| 111 | | | | | | | | | |
| 112 | 57 | 24/4 | 112-114 | 1-4 5-5 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 113 | | | | | | | | | |
| 114 | 58 | 24/14 | 114-116 | 6-12 19-23 | 0.0 ppm | Dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 115 | | | | | | | | 9 | |
| 116 | 60 | 24/18 | 116-118 | 2-4 12-15 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 117 | | | | | | | | | |
| 118 | 61 | 24/10 | 118-120 | 11-17 13-10 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 119 | | | | | | | | | |
| 120 | 62 | 24/12 | 120-122 | 4-7 11-13 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 121 | | | | | | | | | |
| 122 | 63 | 24/10 | 122-124 | 2-12 20-13 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 123 | | | | | | | | | |
| 124 | 64 | 24/8 | 124-126 | 9-15 15-13 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 125 | | | | | | | | 10 | |
| 126 | 65 | 24/13 | 126-128 | 3-11 16-17 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 127 | | | | | | | | | |
| 128 | 66 | 24/10 | 128-130 | 11-20 20-21 | 0.0 ppm | Dense, brown and gray, coarse SAND, some Gravel, trace Silt, wet. | | | |
| 129 | | | | | | | | | |
| 130 | 67 | 24/12 | 130-132 | 5-18 28-30 | 0.0 ppm | Dense, brown and gray, coarse SAND, some Gravel, trace Silt, wet. | | | |
| 131 | | | | | | | | | |
| 132 | 68 | 24/5 | 132-134 | 9-16 21-24 | 0.0 ppm | Dense, brown and gray, coarse SAND, some reddish brown, fine Sand, some Gravel, trace Silt, wet. | | | |
| 133 | | | | | | | | | |
| 134 | 70 | 24/4 | 134-136 | 5-13 20-31 | 0.0 ppm | Dense, brown and gray, GRAVEL, some | 134' GRAVEL | | |

**REMARKS**

8. Temporary well set at 105.0 to 110.0 feet below ground surface. Purged 60.0 gallons. Groundwater sample submitted for laboratory analysis.
9. Temporary well set at 115.0 to 120.0 feet below ground surface. Purged 55.0 gallons. Groundwater sample submitted for laboratory analysis.
10. Temporary well set at 125.0 to 130.0 feet below ground surface. Purged 55.0 gallons. Groundwater sample submitted for laboratory analysis.
11. Temporary well set at 135.0 to 140.0 feet below ground surface. Purged 65.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24B
**Page:** 5 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | medium to coarse Sand, wet. | GRAVEL | 11 | |
| 136–137 | 71 | 24/7 | 136-138 | 4-12 16-23 | 0.0 ppm | Medium dense, brown and gray, GRAVEL, some medium to coarse Sand, wet. | | | |
| 138–139 | 72 | 24/8 | 138-140 | 4-7 18-32 | 0.0 ppm | Medium dense, brown and gray, GRAVEL, some medium to coarse Sand, wet. | | | |
| 140–141 | 73 | 24/7 | 140-142 | 5-11 21-22 | 0.0 ppm | Dense, brown and gray, GRAVEL, some medium to coarse Sand, wet. | | | |
| 142–143 | 74 | 24/12 | 142-144 | 7-13 21-23 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | 142' SAND | | |
| 144–145 | 75 | 24/10 | 144-146 | 6-17 21-22 | 0.0 ppm | Dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | 12 | |
| 146–147 | 76 | 24/10 | 146-148 | 8-15 16-21 | 0.0 ppm | Dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 148–149 | 77 | 24/8 | 148-150 | 5-16 21-24 | 0.0 ppm | Dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 150–151 | 78 | 24/14 | 150-152 | 4-9 16-14 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 152–153 | 79 | 24/4 | 152-154 | 6-10 8-8 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 154–155 | 80 | 24/18 | 154-156 | 4-12 21-20 | 0.0 ppm | Dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | 13 | |
| 156–157 | 81 | 24/6 | 156-158 | 5-8 13-10 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 158–159 | 82 | 24/6 | 158-160 | 7-11 11-12 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 160–161 | 83 | 24/7 | 160-162 | 5-8 9-9 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 162–163 | 84 | 24/5 | 162-164 | 5-10 19-26 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 164–165 | 85 | 24/0 | 164-166 | 5-13 22-36 | | NO RECOVERY. | 164' NO RECOVERY | 14 | |
| 166–167 | 86 | 24/0 | 166-168 | 7-19 25-39 | | NO RECOVERY; Switched to bailer for recovery. Bailer: brown and gray, fine to medium SAND, wet. | | | |
| 168–169 | 87 | 24/0 | 168-170 | 2-8 16-22 | | NO RECOVERY; Bailer: brown and gray, fine to medium SAND, wet. | | | |

**REMARKS**

12. Temporary well set at 145.0 to 150.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
13. Temporary well set at 155.0 to 160.0 feet below ground surface. Purged 120.0 gallons. Groundwater sample submitted for laboratory analysis.
14. Temporary well set at 165.0 to 170.0 feet below ground surface. Purged 80.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24B
**Page:** 6 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 171 | 88 | 24/0 | 170-172 | 7-11 19-22 | | NO RECOVERY: Bailer: brown and gray, fine to medium SAND, wet. | NO RECOVERY | | |
| 172 | 89 | 24/5 | 172-174 | 2-4 7-10 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | 172' SAND | | |
| 174 | 90 | 24/0 | 174-176 | 5-7 11-16 | | NO RECOVERY; Bailer: brown and gray, fine to medium SAND, wet. | 174' NO RECOVERY | 15 | |
| 176 | 91 | 24/10 | 176-178 | 4-7 17-21 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | 176' SAND | | |
| 178 | 92 | 24/20 | 178-180 | 4-10 28-35 | 0.0 ppm | Dense, brown and gray, fine to medium SAND, wet. | | | |
| 180 | 93 | 24/16 | 180-182 | 3-10 17-23 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 182 | 94 | 24/7 | 182-184 | 3-8 12-17 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 184 | 95 | 24/6 | 184-186 | 8-10 13-31 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | 16 | |
| 186 | 96 | 24/0 | 186-188 | 5-8 19-20 | | NO RECOVERY; Bailer: brown and gray, fine to medium SAND, wet. | 186' NO RECOVERY | | |
| 188 | 97 | 24/3 | 188-190 | 5-5 12-14 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | 188' SAND | | |
| 190 | 98 | 24/10 | 190-192 | 3-12 20-28 | 0.0 ppm | Dense, brown and gray, fine to medium SAND, wet. | | | |
| 192 | 99 | 24/4 | 192-194 | 2-5 9-13 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 194 | 100 | 24/2 | 194-196 | 2-6 9-11 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | 17 | |
| 196 | 101 | 24/6 | 196-198 | 5-11 17-21 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 198 | 102 | 24/4 | 198-200 | 3-3 8-9 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 200 | 103 | 24/6 | 200-202 | 4-12 15-22 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 202 | 104 | 24/16 | 202-204 | 4-4 7-12 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 204 | 105 | 24/16 | 204-206 | 4-9 17-24 | 0.0 ppm | Medium dense, brown and gray, fine to | | | |

**REMARKS**

15. Temporary well set at 175.0 to 180.0 feet below ground surface. Purged 125.0 gallons. Groundwater sample submitted for laboratory analysis.
16. Temporary well set at 185.0 to 190.0 feet below ground surface. Purged 135.0 gallons. Groundwater sample submitted for laboratory analysis.
17. Temporary well set at 195.0 to 200.0 feet below ground surface. Purged 135.0 gallons. Groundwater sample submitted for laboratory analysis.
18. Temporary well set at 205.0 to 210.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

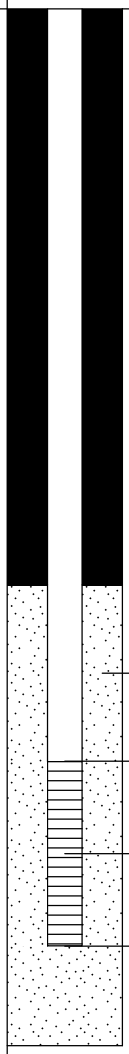
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24B
**Page:** 7 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | medium SAND, wet. | SAND | 18 |
| 206–207 | 106 | 24/10 | 206-208 | 5-11 25-27 | 0.0 ppm | Dense, brown and gray, fine to medium SAND, wet. | | |
| 208–209 | 107 | 24/14 | 208-210 | 6-15 34-37 | 0.0 ppm | Dense, brown and gray, fine to medium SAND, wet. | | |
| 210–211 | 108 | 24/18 | 210-212 | 7-24 35-50 | 0.0 ppm | Very dense, brown and gray, fine to medium SAND, wet. | | |
| 212–213 | 109 | 24/22 | 212-214 | 2-9 17-30 | 0.0 ppm | Medium dense, brown, fine to medium SAND, trace Gravel, trace Silt, wet. | | |
| 214–215 | 110 | 24/6 | 214-216 | 5-22-42/5" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | 19 |
| 216–217 | 111 | 24/16 | 216-218 | 9-34-50/4" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 218–219 | 112 | 18/6 | 218-219.5 | 3-17-41 | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 220–221 | 113 | 24/12 | 220-222 | 10-41-50/5" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 222–223 | 114 | 18/6 | 222-223.5 | 9-20-33 | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 224–225 | 115 | 24/10 | 224-226 | 6-24-50/5" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | 20 |
| 226–227 | 116 | 18/5 | 226-227.5 | 4-17-35 | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 228–229 | 117 | 18/12 | 228-229.5 | 8-18-43 | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 230–231 | 118 | 24/12 | 230-232 | 16-35-50/5" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | 232' | |
| 232 | | | | | | Bottom of Borehole at 232.0 Feet | | 21 |
| 233–239 | | | | | | | | |

**Equipment Installed**




**REMARKS**

19. Temporary well set at 215.0 to 220.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
20. Temporary well set at 225.0 to 230.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
21. Monitoring well was installed in borehole upon completion. Well screen set from 224.6 to 229.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24D
**Page:** 1 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Christine Cano/John Morehouse
**Date Start/Finish:** 9-23-19 / 10-1-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

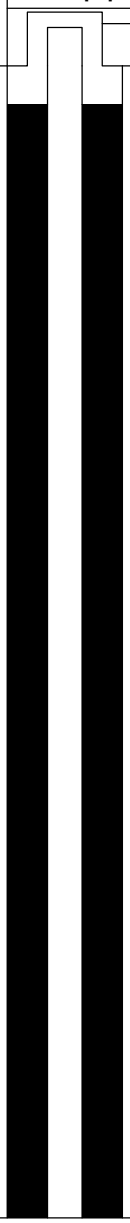
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/16 | 0-2 | 1-1 1-2 | 0.0 ppm | Very loose, brown, fine SAND, some Silt, moist. Changing at 0.3 feet to: Very loose, light brown to tan, fine SAND, trace Silt, moist. | SAND | 1 |
| 2 3 | 2 | 24/16 | 2-4 | 2-2 3-8 | 0.0 ppm | Loose, light tan, very fine SAND, trace Silt, moist. | | |
| 4 5 | 3 | 24/20 | 4-6 | 9-10 12-9 | 0.0 ppm | Medium dense, light tan, very fine SAND and SILT, moist. | | |
| 6 7 | 4 | 24/24 | 6-8 | 5-7 10-10 | 0.0 ppm | Medium dense, light brown, fine SAND, trace Clay, moist. | | |
| 8 9 | 5 | 24/24 | 8-10 | 7-12 13-12 | 0.0 ppm | Medium dense, light brown, fine SAND, trace Clay, moist. | | |
| 10 11 | 6 | 24/24 | 10-12 | 6-3 4-4 | 0.0 ppm | Loose, light brown, fine SAND, trace Clay, moist. Changing at 11.0 feet to: Loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 12 13 | 7 | 24/12 | 12-14 | 1-3 2-2 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, moist. | | |
| 14 15 | 8 | 24/20 | 14-16 | 2-3 4-5 | 0.0 ppm | Loose, brown, fine SAND, trace Clay, moist. Changing at 15.0 feet to: Loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 16 17 | 9 | 24/10 | 16-18 | 3-6 5-4 | 0.0 ppm | Medium dense, tan, fine to medium SAND, trace Silt, moist. | | |
| 18 19 | 10 | 24/12 | 18-20 | 2-3 3-2 | 0.0 ppm | Loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 20 21 | 11 | 24/14 | 20-22 | 1-2 2-3 | 0.0 ppm | Very loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 22 23 | 12 | 24/14 | 22-24 | 1-2 2-3 | 0.0 ppm | Very loose, tan, fine to medium SAND, trace Silt, moist. | | |
| 24 25 | 13 | 24/14 | 24-26 | 3-4 4-4 | 0.0 ppm | Loose, light tan, fine to medium SAND, trace Silt, moist. | | |
| 26 27 | 14 | 24/14 | 26-28 | 1-3 3-3 | 0.0 ppm | Loose, light tan, fine to medium SAND, trace Silt, moist. | | |
| 28 29 | 15 | 24/20 | 28-30 | 1-4 3-3 | 0.0 ppm | Loose, light tan, fine to medium SAND, trace Silt, moist. | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/3/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24D
**Page:** 2 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | 16 | 24/19 | 30-32 | 3-2 3-4 | 0.0 ppm | Loose, light tan, fine to medium SAND, trace Silt, moist. | SAND | | |
| 32 33 | 17 | 24/14 | 32-34 | 4-5 7-4 | 0.0 ppm | Medium dense, light tan, fine to medium SAND, trace Silt, moist. | | | |
| 34 35 | 18 | 24/22 | 34-36 | 4-5 7-8 | 0.0 ppm | Medium dense, light tan, fine to medium SAND, trace Silt, trace Gravel, moist. | | | |
| 36 37 | 19 | 24/17 | 36-38 | 4-5 5-6 | 0.0 ppm | Loose, tan, fine to medium SAND, trace Silt, moist. Changing at 37.5 feet to: Loose, tan, fine to coarse SAND, trace Silt, moist. | | | |
| 38 39 | 20 | 24/16 | 38-40 | 5-7 7-9 | 0.0 ppm | Medium dense, tan, fine to coarse SAND, trace Silt, moist. | | | |
| 40 41 | 21 | 24/14 | 40-42 | 4-7 7-9 | 0.0 ppm | Medium dense, tan, Silty fine to medium SAND, trace Gravel, moist. | | | |
| 42 43 | 22 | 24/13 | 42-44 | 5-9 9-10 | 0.0 ppm | Medium dense, tan, Silty fine to coarse SAND, some Gravel, moist. | | | |
| 44 45 | 23 | 24/5 | 44-46 | 6-10 20-20 | 0.0 ppm | Medium dense, tan, Silty fine to coarse SAND, trace Gravel, moist. | | | |
| 46 47 | 24 | 24/12 | 46-48 | 5-16 33-16 | 0.0 ppm | Dense, tan, Sandy GRAVEL, trace Silt, moist. | 46' GRAVEL | | |
| 48 49 | 25 | 24/4 | 48-50 | 11-23 21-13 | 0.0 ppm | Dense, tan, Sandy GRAVEL, trace Silt, moist. | | | |
| 50 51 | 26 | 24/0 | 50-52 | 17-11 10-9 | | NO RECOVERY. | 50' NO RECOVERY | | |
| 52 53 | 27 | 24/1 | 52-54 | 18-15 12-9 | 0.0 ppm | Medium dense, tan, coarse SAND, wet. | 52' SAND | 2 | |
| 54 55 | 28 | 24/4 | 54-56 | 15-9 7-7 | 0.0 ppm | Medium dense, tan, fine to coarse SAND, trace Gravel, wet. | | 3 | |
| 56 57 | 29 | 24/18 | 56-58 | 2-2 2-4 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 58 59 | 30 | 24/17 | 58-60 | 1-1 2-3 | 0.0 ppm | Very loose, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 60 61 | 31 | 24/0 | 60-62 | 1-2 4-6 | | NO RECOVERY. | 60' NO RECOVERY | | |
| 62 63 | 32 | 24/5 | 62-64 | 2-2 4-4 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. | 62' SAND | | |
| 64 | 33 | 24/8 | 64-66 | 3-3 4-5 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, | | | |

**REMARKS**

2. Groundwater was encountered at approximately 52.0 feet below ground surface.
3. Temporary well set at 55.0 to 60.0 feet below ground surface. Purged 70.0 gallons. Groundwater sample submitted for laboratory analysis.
4. Temporary well set at 65.0 to 70.0 feet below ground surface. Purged 35.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/3/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24D
**Page:** 3 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | wet. | SAND | 4 | |
| 66–67 | 34 | 24/14 | 66-68 | 1-2 2-3 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 68–69 | 35 | 24/14 | 68-70 | 1-2 3-10 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 70–71 | 36 | 24/24 | 70-72 | 7-9 10-12 | 0.0 ppm | Medium dense, tan, fine to coarse SAND, trace Silt, wet. | | | |
| 72–73 | 37 | 24/15 | 72-74 | 4-3 2-2 | 0.0 ppm | Loose, tan, fine to coarse SAND, trace Silt, wet. Changing at 73.5 feet to: Loose, brown, Sandy GRAVEL, wet. | 73.5' 74' GRAVEL | | |
| 74–75 | 38 | 24/14 | 74-76 | 6-8 8-8 | 0.0 ppm | Medium dense, brown, fine to coarse SAND and Gravel, trace Silt, wet. | SAND | 5 | |
| 76–77 | 39 | 24/2 | 76-78 | 2-3 3-4 | 0.0 ppm | Loose, brown, fine to coarse SAND and Gravel, trace Silt, wet. | | | |
| 78–79 | 40 | 24/14 | 78-80 | 4-5 5-5 | 0.0 ppm | Medium dense, brown to gray, GRAVEL, some fine to coarse Sand, wet. | 78' GRAVEL | | |
| 80–81 | 41 | 24/3 | 80-82 | 5-5 5-7 | 0.0 ppm | Medium dense, brown to gray, GRAVEL, some fine to coarse Sand, wet. | | | |
| 82–83 | 42 | 24/16 | 82-84 | 2-3 4-4 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | 82' SAND | | |
| 84–85 | 43 | 24/24 | 84-86 | 2-2 2-4 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | 6 | |
| 86–87 | 44 | 24/16 | 86-88 | 2-1 2-2 | 0.0 ppm | Very loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 88–89 | 45 | 24/12 | 88-90 | 3-3 3-5 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 90–91 | 46 | 24/8 | 90-92 | 2-3 6-7 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 92–93 | 47 | 24/16 | 92-94 | 1-1 2-3 | 0.0 ppm | Very loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 94–95 | 48 | 24/7 | 94-96 | 1-2 3-4 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | 7 | |
| 96–97 | 49 | 24/20 | 96-98 | 2-2 5-6 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 98–99 | 50 | 24/16 | 98-100 | 4-2 4-5 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |

**REMARKS**

5. Temporary well set at 75.0 to 80.0 feet below ground surface. Purged 45.0 gallons. Groundwater sample submitted for laboratory analysis.
6. Temporary well set at 85.0 to 90.0 feet below ground surface. Purged 75.0 gallons. Groundwater sample submitted for laboratory analysis.
7. Temporary well set at 95.0 to 100.0 feet below ground surface. Purged 90.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/3/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24D
**Page:** 4 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 101 | 51 | 24/10 | 100-102 | 3-7 11-13 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | SAND | | |
| 102 103 | 52 | 24/12 | 102-104 | 2-2 3-7 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 104 105 | 53 | 24/10 | 104-106 | 3-4 5-7 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | 8 | |
| 106 107 | 54 | 24/14 | 106-108 | 3-9 10-10 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 108 109 | 55 | 24/16 | 108-110 | 2-4 8-9 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 110 111 | 56 | 24/3 | 110-112 | 3-7 9-11 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | Bentonite Slurry / Grout |
| 112 113 | 57 | 24/4 | 112-114 | 1-4 5-5 | 0.0 ppm | Loose, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 114 115 | 58 | 24/14 | 114-116 | 6-12 19-23 | 0.0 ppm | Dense, brown and gray, coarse SAND, some Gravel, wet. | | 9 | |
| 116 117 | 60 | 24/18 | 116-118 | 2-4 12-15 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 118 119 | 61 | 24/10 | 118-120 | 11-17 13-10 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 120 121 | 62 | 24/12 | 120-122 | 4-7 11-13 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 122 123 | 63 | 24/10 | 122-124 | 2-12 20-13 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 124 125 | 64 | 24/8 | 124-126 | 9-15 15-13 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | 10 | |
| 126 127 | 65 | 24/13 | 126-128 | 3-11 16-17 | 0.0 ppm | Medium dense, brown and gray, coarse SAND, some Gravel, wet. | | | |
| 128 129 | 66 | 24/10 | 128-130 | 11-20 20-21 | 0.0 ppm | Dense, brown and gray, coarse SAND, some Gravel, trace Silt, wet. | | | |
| 130 131 | 67 | 24/12 | 130-132 | 5-18 28-30 | 0.0 ppm | Dense, brown and gray, coarse SAND, some Gravel, trace Silt, wet. | | | |
| 132 133 | 68 | 24/5 | 132-134 | 9-16 21-24 | 0.0 ppm | Dense, brown and gray, coarse SAND, some reddish brown, fine Sand, some Gravel, trace Silt, wet. | | | |
| 134 | 70 | 24/4 | 134-136 | 5-13 20-31 | 0.0 ppm | Dense, brown and gray, GRAVEL, some | 134' GRAVEL | | |

**REMARKS**

8. Temporary well set at 105.0 to 110.0 feet below ground surface. Purged 60.0 gallons. Groundwater sample submitted for laboratory analysis.
9. Temporary well set at 115.0 to 120.0 feet below ground surface. Purged 55.0 gallons. Groundwater sample submitted for laboratory analysis.
10. Temporary well set at 125.0 to 130.0 feet below ground surface. Purged 55.0 gallons. Groundwater sample submitted for laboratory analysis.
11. Temporary well set at 135.0 to 140.0 feet below ground surface. Purged 65.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/3/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24D
**Page:** 5 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | medium to coarse Sand, wet. | GRAVEL | 11 | |
| 136–137 | 71 | 24/7 | 136-138 | 4-12 16-23 | 0.0 ppm | Medium dense, brown and gray, GRAVEL, some medium to coarse Sand, wet. | | | |
| 138–139 | 72 | 24/8 | 138-140 | 4-7 18-32 | 0.0 ppm | Medium dense, brown and gray, GRAVEL, some medium to coarse Sand, wet. | | | |
| 140–141 | 73 | 24/7 | 140-142 | 5-11 21-22 | 0.0 ppm | Dense, brown and gray, GRAVEL, some medium to coarse Sand, wet. | | | |
| 142–143 | 74 | 24/12 | 142-144 | 7-13 21-23 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | 142' SAND | | |
| 144–145 | 75 | 24/10 | 144-146 | 6-17 21-22 | 0.0 ppm | Dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | 12 | |
| 146–147 | 76 | 24/10 | 146-148 | 8-15 16-21 | 0.0 ppm | Dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 148–149 | 77 | 24/8 | 148-150 | 5-16 21-24 | 0.0 ppm | Dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 150–151 | 78 | 24/14 | 150-152 | 4-9 16-14 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 152–153 | 79 | 24/4 | 152-154 | 6-10 8-8 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 154–155 | 80 | 24/18 | 154-156 | 4-12 21-20 | 0.0 ppm | Dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | 13 | |
| 156–157 | 81 | 24/6 | 156-158 | 5-8 13-10 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 158–159 | 82 | 24/6 | 158-160 | 7-11 11-12 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 160–161 | 83 | 24/7 | 160-162 | 5-8 9-9 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 162–163 | 84 | 24/5 | 162-164 | 5-10 19-26 | 0.0 ppm | Medium dense, brown and gray, fine to coarse SAND, some Gravel, wet. | | | |
| 164–165 | 85 | 24/0 | 164-166 | 5-13 22-36 | | NO RECOVERY. | 164' NO RECOVERY | 14 | |
| 166–167 | 86 | 24/0 | 166-168 | 7-19 25-39 | | NO RECOVERY; Switched to bailer for recovery. Bailer: brown and gray, fine to medium SAND, wet. | | | |
| 168–169 | 87 | 24/0 | 168-170 | 2-8 16-22 | | NO RECOVERY; Bailer: brown and gray, fine to medium SAND, wet. | | | |

**REMARKS**

12. Temporary well set at 145.0 to 150.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
13. Temporary well set at 155.0 to 160.0 feet below ground surface. Purged 120.0 gallons. Groundwater sample submitted for laboratory analysis.
14. Temporary well set at 165.0 to 170.0 feet below ground surface. Purged 80.0 gallons. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/3/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24D
**Page:** 6 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 88 | 24/0 | 170-172 | 7-11 19-22 | | NO RECOVERY: Bailer: brown and gray, fine to medium SAND, wet. | NO RECOVERY | | |
| 171 | | | | | | | 172' | | |
| 172 | 89 | 24/5 | 172-174 | 2-4 7-10 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | SAND | | |
| 173 | | | | | | | 174' | | |
| 174 | 90 | 24/0 | 174-176 | 5-7 11-16 | | NO RECOVERY; Bailer: brown and gray, fine to medium SAND, wet. | NO RECOVERY | | |
| 175 | | | | | | | 176' | 15 | |
| 176 | 91 | 24/10 | 176-178 | 4-7 17-21 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | SAND | | |
| 177 | | | | | | | | | |
| 178 | 92 | 24/20 | 178-180 | 4-10 28-35 | 0.0 ppm | Dense, brown and gray, fine to medium SAND, wet. | | | |
| 179 | | | | | | | | | |
| 180 | 93 | 24/16 | 180-182 | 3-10 17-23 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 181 | | | | | | | | | |
| 182 | 94 | 24/7 | 182-184 | 3-8 12-17 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 183 | | | | | | | | | |
| 184 | 95 | 24/6 | 184-186 | 8-10 13-31 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 185 | | | | | | | | 16 | |
| 186 | 96 | 24/0 | 186-188 | 5-8 19-20 | | NO RECOVERY; Bailer: brown and gray, fine to medium SAND, wet. | 186' NO RECOVERY | | |
| 187 | | | | | | | 188' | | |
| 188 | 97 | 24/3 | 188-190 | 5-5 12-14 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | SAND | | |
| 189 | | | | | | | | | |
| 190 | 98 | 24/10 | 190-192 | 3-12 20-28 | 0.0 ppm | Dense, brown and gray, fine to medium SAND, wet. | | | |
| 191 | | | | | | | | | |
| 192 | 99 | 24/4 | 192-194 | 2-5 9-13 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 193 | | | | | | | | | |
| 194 | 100 | 24/2 | 194-196 | 2-6 9-11 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 195 | | | | | | | | 17 | |
| 196 | 101 | 24/6 | 196-198 | 5-11 17-21 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 197 | | | | | | | | | |
| 198 | 102 | 24/4 | 198-200 | 3-3 8-9 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 199 | | | | | | | | | |
| 200 | 103 | 24/6 | 200-202 | 4-12 15-22 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 201 | | | | | | | | | |
| 202 | 104 | 24/16 | 202-204 | 4-4 7-12 | 0.0 ppm | Medium dense, brown and gray, fine to medium SAND, wet. | | | |
| 203 | | | | | | | | | |
| 204 | 105 | 24/16 | 204-206 | 4-9 17-24 | 0.0 ppm | Medium dense, brown and gray, fine to | | | |

**REMARKS**

15. Temporary well set at 175.0 to 180.0 feet below ground surface. Purged 125.0 gallons. Groundwater sample submitted for laboratory analysis.
16. Temporary well set at 185.0 to 190.0 feet below ground surface. Purged 135.0 gallons. Groundwater sample submitted for laboratory analysis.
17. Temporary well set at 195.0 to 200.0 feet below ground surface. Purged 135.0 gallons. Groundwater sample submitted for laboratory analysis.
18. Temporary well set at 205.0 to 210.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/3/20

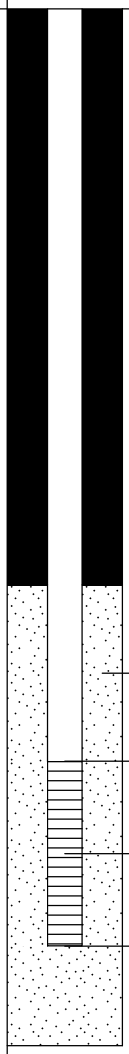
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-24D
**Page:** 7 **of** 7
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | medium SAND, wet. | SAND | 18 |
| 206–207 | 106 | 24/10 | 206-208 | 5-11 25-27 | 0.0 ppm | Dense, brown and gray, fine to medium SAND, wet. | | |
| 208–209 | 107 | 24/14 | 208-210 | 6-15 34-37 | 0.0 ppm | Dense, brown and gray, fine to medium SAND, wet. | | |
| 210–211 | 108 | 24/18 | 210-212 | 7-24 35-50 | 0.0 ppm | Very dense, brown and gray, fine to medium SAND, wet. | | |
| 212–213 | 109 | 24/22 | 212-214 | 2-9 17-30 | 0.0 ppm | Medium dense, brown, fine to medium SAND, trace Gravel, trace Silt, wet. | | |
| 214–215 | 110 | 24/6 | 214-216 | 5-22-42/5" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | 19 |
| 216–217 | 111 | 24/16 | 216-218 | 9-34-50/4" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 218–219 | 112 | 18/6 | 218-219.5 | 3-17-41 | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 220–221 | 113 | 24/12 | 220-222 | 10-41-50/5" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 222–223 | 114 | 18/6 | 222-223.5 | 9-20-33 | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 224–225 | 115 | 24/10 | 224-226 | 6-24-50/5" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | 20 |
| 226–227 | 116 | 18/5 | 226-227.5 | 4-17-35 | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 228–229 | 117 | 18/12 | 228-229.5 | 8-18-43 | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | | |
| 230–231 | 118 | 24/12 | 230-232 | 16-35-50/5" | | Very dense, brown, fine to coarse SAND, trace Gravel, trace Silt, wet. | 232' | |
| 232 | | | | | | Bottom of Borehole at 232.0 Feet | | 21 |
| 233–239 | | | | | | | | |

**Equipment Installed**




**REMARKS**

19. Temporary well set at 215.0 to 220.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
20. Temporary well set at 225.0 to 230.0 feet below ground surface. Groundwater sample submitted for laboratory analysis.
21. Monitoring well was installed in borehole upon completion. Well screen set from 224.6 to 229.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/3/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

# 1855 House Street: Off-Site Borings
## 2805 Rogue River Road, NE
## Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 1 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-1-18 / 11-9-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | NA |
| **Hammer Wt.:** | 140 lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

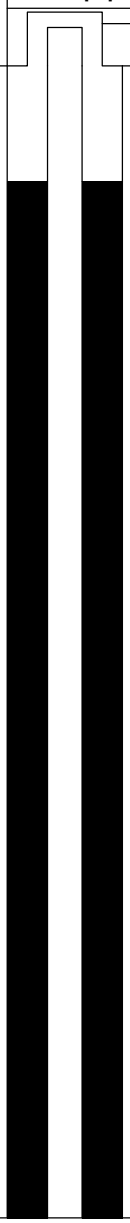
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/14.4 | 0-2 | 1-2<br>1-1 | 0.0 ppm | Very dark grayish-brown, moderately sorted, fine to mediumm grained SAND, some Silt, trace Gravel, moist; grading at 1.0 feet to: Dark yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, grading coarser, moist. Changing at 1.2 feet to: NO RECOVERY. | SAND<br>1.2'<br>NO RECOVERY | 1 |
| 1 | | | | | | | | |
| 2 | 2 | 24/6 | 2-4 | 2-2<br>1-2 | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium grained SAND, trace Silt, trace Gravel, moist. Changing at 2.4 feet to: Yellowish-brown, poorly sorted, fine to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 2.5 feet to: NO RECOVERY. | 2'<br>SAND<br>2.5'<br>NO RECOVERY | |
| 3 | | | | | | | | |
| 4 | 3 | 24/6 | 4-6 | 3-1<br>2-2 | 0.0 ppm | Yellowish-brown, poorly sorted, fine to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 4.4 feet to: Dark yellowish-brown, poorly sorted, SILT, trace Clay, trace Gravel, slightly plastic, moderately cohesive, moist. Changing at 4.5 feet to: NO RECOVERY. | 4'<br>SAND<br>4.4'<br>4.5' SILT<br>NO RECOVERY | |
| 5 | | | | | | | | |
| 6 | 4 | 24/7.2 | 6-8 | 11-16<br>29-23 | 0.0 ppm | Pale brown to light yellowish-brown to grayish-brown to brown to dark yellowish-brown, poorly sorted, medium to coarse grained SAND, some Gravel, trace Silt, moist. Changing at 6.6 feet to: NO RECOVERY. | 6'<br>SAND<br>6.6'<br>NO RECOVERY | |
| 7 | | | | | | | | |
| 8 | 5 | 24/0 | 8-10 | 50/6" | 0.0 ppm | NO RECOVERY. | | |
| 9 | | | | | | | | |
| | | | | | | | 10' | |

**Equipment Installed**




**REMARKS**

1. Field screening of samles for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million (ppm) of isobutylene. groundwater was measured at 0.0 ppm.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS ROGUE RIVER RD.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 2 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 6 | 24/10.8 | 10-12 | 10-19<br>20-13 | 0.0 ppm | Grayish-brown to brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 10.8 feet to: Pale brown to light yellowish-brown, moderately sorted, coarse to medium grained SAND, trace Silt, moist. Changing at 10.9 feet to: NO RECOVERY. | SAND<br>10.9'<br>NO RECOVERY | | |
| 11 | | | | | | | | | |
| 12 | 7 | 24/9.6 | 12-14 | 11-10<br>12-11 | 0.0 ppm | Pale brown to light yellowish-brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 12.8 feet to: NO RECOVERY. | 12'<br>SAND<br>12.8'<br>NO RECOVERY | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/6 | 14-16 | 11-12<br>8-8 | 0.0 ppm | Pale brown to light yellowish-brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 14.5 feet to: NO RECOVERY. | 14'<br>SAND<br>14.5'<br>NO RECOVERY | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/10.8 | 16-18 | 13-15<br>13-13 | 0.0 ppm | Pale brown to light yellowish-brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 16.9 feet to: NO RECOVERY. | 16'<br>SAND<br>16.9'<br>NO RECOVERY | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/8.4 | 18-20 | 9-29<br>24-23 | 0.0 ppm | Pale brown to light yellowish-brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 18.7 feet to: NO RECOVERY. | 18'<br>SAND<br>18.7'<br>NO RECOVERY | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/8.4 | 20-22 | 21-19<br>14-16 | 0.0 ppm | Pale brown to light yellowish-brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 20.7 feet to: NO RECOVERY. | 20'<br>SAND<br>20.7'<br>NO RECOVERY | | |
| 21 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS ROGUE RIVER RD.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 3 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 22 | 12 | 24/9.6 | 22-24 | 6-15 12-12 | 0.0 ppm | Pale brown to light yellowish-brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 22.3 feet to: Very pale brown, very well sorted, fine grained SAND, trace Silt, moist. Changing at 22.4 feet to: Pale brown to light yellowish-brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 22.8 feet to: NO RECOVERY. | 22' SAND; 22.8' NO RECOVERY | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/4.8 | 24-26 | 14-5 5-8 | 0.0 ppm | Pale brown to light yellowish-brown, poorly sorted, coarse to medium grained SAND, some Gravel, trace Silt, moist. Changing at 24.4 feet to: NO RECOVERY. | 24' SAND; 24.4' NO RECOVERY | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/18 | 26-28 | 4-6 6-5 | 0.0 ppm | Dark reddish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 26.3 feet to: Dark brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 27.5 feet to: NO RECOVERY. | 26' CLAY & SILT; 27.5' NO RECOVERY | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/19.2 | 28-30 | 4-3 3-5 | 0.0 ppm | Dark brown, porly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 29.6 feet to: NO RECOVERY. | 28' CLAY & SILT; 29.6' NO RECOVERY | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/21.6 | 30-32 | 14-21 16-25 | 0.0 ppm | Strong brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, moderately plastic, moderately cohesive, moist. Changing at 31.7 feet to: Dark yellowish-brown, poorly sorted, fine grained SAND, some Silt, trace Gravel, non-plastic, moderately cohesive, moist to wet. Changing at 31.8 feet to: NO RECOVERY. | 30' SILT & CLAY; 31.7' SAND | | Bentonite / Grout |
| 31 | | | | | | | | | |
| 32 | 17 | 24/15.6 | 32-34 | 7-10 15-22 | 0.0 ppm | Strong brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, moderately plastic, moderately cohesive, moist. Changing 33.2 feet to: Dark yellowish-brown, moderately sorted, fine to coarse grained SAND, trace Silt, wet. Changing at 33.3 feet to: NO | 31.8' NO RECOVERY; 32' SILT & CLAY; 33.2' | | |
| 33 | | | | | | | 33.3' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS ROGUE RIVER RD.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 4 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | RECOVERY. | SAND NO RECOVERY | | |
| 34 | 18 | 24/19.2 | 34-36 | 15-32-50/5" | 0.0 ppm | Strong brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, moderately plastic, moderately cohesive, moist. Changing at 34.2 feet to: Dark yellowish-brown, poorly sorted SILT & CLAY, some Sand, trace Gravel, slightly plastic, cohesive, moist. Changing at 35.6 feet to: NO RECOVERY. | 34' SILT & CLAY 35.6' NO RECOVERY | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/10.8 | 36-38 | 1-9 21-19 | 0.0 ppm | Dark yellowish-brown, poorly sorted, SILT & CLAY, some Sand, trace Gravel, slightly plastic, cohesive, moist. Changing at 36.9 feet to: NO RECOVERY. | 36' SILT & CLAY 36.9' NO RECOVERY | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/15.6 | 38-40 | 22-37 38-37 | 0.0 ppm | Brown to yellowish-brown, very well sorted, fine to medium grained SAND, trace Silt, moist to wet. Changing at 38.3 feet to: Dark yellowish-brown, poorly sorted, SILT & CLAY, some Sand, trace Gravel, occasional very thin Sand partings, slightly plastic, cohesive, moist. Changing at 39.3 feet to: NO RECOVERY. | 38' SAND 38.3' SILT & CLAY 39.3' NO RECOVERY | | |
| 39 | | | | | | | | | |
| 40 | 21 | 24/21.6 | 40-42 | 13-29 39-50 | 0.0 ppm | Dark yellowish-brown to brown, well sorted, Silty CLAY, plastic, cohesive, bedding, moist. Changing at 40.6 feet to: Yellowish-brown to brown, well sorted, fine to medium grained, SAND, trace Silt, wet. Changing at 40.7 feet to: Dark yellowish-brown, well sorted, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 40.8 feet to: Yellowish-brown to brown, well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 41.8 feet to: NO RECOVERY. Yellowish-brown to brown, well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 43.4 feet to: Dark yellowish-brown, well sorted, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 43.7 feet to: NO RECOVERY. | 40' Silty CLAY 40.6' 40.7' SAND 40.8' SiltyCLAY SAND 41.8' 42' NO RECOVERY SAND 43.4' Silty CLAY 43.7' NO RECOVERY | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/20.4 | 42-44 | 1-2 12-21 | 0.0 ppm | | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/24 | 44-46 | 5-19 41-50/3" | 0.0 ppm | Dark yellowish-brown, well sorted, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 45.6 feet to: Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, slightly cohesive, | 44' Silty CLAY | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-25/MW-25M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 5 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | wet. | Silty CLAY 45.6' | | |
| 46 | 24 | 24/21.6 | 46-48 | 14-37-50/5" | 0.0 ppm | Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, slightly cohesive, wet. Changing at 46.6 feet to: Dark brown to yellowish-brown, well sorted, Silty CLAY, plastic, cohesive, varved with Silt & Clay, wet. Changing at 47.6 feet to: Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, slightly cohesive, wet. Changing at 47.8 feet to: NO RECOVERY. | SAND 46.6' | 2 | |
| 47 | | | | | | | Silty CLAY 47.6' | | |
| | | | | | | | 47.8' SAND | | |
| 48 | 25 | 24/16.8 | 48-50 | 8-22 27-35 | 0.0 ppm | Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, slightly cohesive, wet. Changing at 48.4 feet to: Dark yellowish-brown, well sorted, SILT, some Sand, moist to wet. Changing at 49.0 feet to: Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, slightly cohesive, wet. Changing at 49.4 feet to: NO RECOVERY. | 48' NO RECOVERY | | |
| | | | | | | | SAND 48.4' | | |
| 49 | | | | | | | SILT 49' | | |
| | | | | | | | SAND 49.4' | | |
| | | | | | | | NO RECOVERY 50' | | |
| 50 | 26 | 24/15.6 | 50-52 | 8-23 32-37 | 0.0 ppm | Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, lightly cohesive, wet. Changing at 51.3 feet to: NO RECOVERY. | SAND | | |
| 51 | | | | | | | 51.3' | | |
| | | | | | | | NO RECOVERY 52' | | |
| 52 | 27 | 24/18 | 52-54 | 6-14 21-35 | 0.0 ppm | Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, slighty cohesive, wet. Changing at 53.5 feet to: NO RECOVERY. | SAND | | |
| 53 | | | | | | | 53.5' | | |
| | | | | | | | NO RECOVERY 54' | | |
| 54 | 28 | 24/19.2 | 54-56 | 4-14 21-33 | 0.0 ppm | Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, slightly cohesive, wet. Changing at 55.6 feet to: NO RECOVERY. | SAND | | |
| 55 | | | | | | | 55.6' | | |
| | | | | | | | NO RECOVERY 56' | | |
| 56 | 29 | 24/19.2 | 56-58 | 4-12 17-21 | 0.0 ppm | Dark yellowish-brown, very well sorted, fine grained SAND, some Silt, slightly cohesive, wet. Changing at 56.5 feet to: Dark | SAND | | |

**REMARKS**

2. Groundwater was encountered at approximately 45.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS ROGUE RIVER RD.GPJ GZA_CORP.GDT 2/27/19

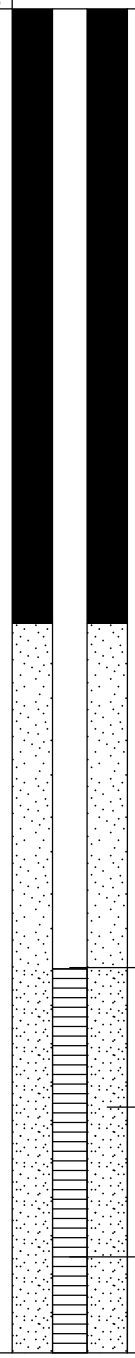
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 6 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 57 | | | | | | yellowish-brown, moderately sorted, fine to coarse grained SAND, little Silt, trace Gravel, wet, with occasional lenses discontinuous Silty Clay, plastic, cohesive, moist. Changing at 56.8 feet to: Dark yellowish-brown, moderately sorted, fine to medium grained SAND, little Silt, wet, with occasional lenses of Silty Clay. Changing at 57.6 feet to: NO RECOVERY. Dark yellowish-brown, well sorted, fine to medium grained SAND, little Silt, wet. Changing at 59.9 feet to: NO RECOVERY. | SAND | |
| 58 | 30 | 24/22.8 | 58-60 | 5-10 13-18 | 0.0 ppm | | 57.6' NO RECOVERY 58' SAND | |
| 59 | | | | | | | | |
| 60 | 31 | 24/14.4 | 60-62 | 4-9 18-2 | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium grained SAND, little Silt, wet. Changing at 61.2 feet to: NO RECOVERY. | 59.9' 60' NO RECOVERY SAND | |
| 61 | | | | | | | 61.2' NO RECOVERY | |
| 62 | 32 | 24/24 | 62-64 | 2-6 15-27 | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium grained SAND, little Silt, wet. | 62' SAND | |
| 63 | | | | | | | | |
| 64 | 33 | 24/24 | 64-66 | 3-7 23-31 | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium grained SAND, little Silt, wet. | | |
| 65 | | | | | | | | |
| 66 | 34 | 24/12 | 66-68 | 3-13 29-35 | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium grained SAND, little Silt, wet. Changing at 66.9 feet to: Dark brown to dark yellowish-brown, very well sorted, fine grained SAND, trace Silt, wet with Silty Clay varves, plastic, cohesive, moist. Changing at 67.0 feet to: NO RECOVERY. | | |
| 67 | | | | | | | 67' NO RECOVERY | |
| 68 | 35 | 24/22.8 | 68-70 | 5-20-50/6" | 0.0 ppm | Dark yellowish-brown, well sorted, fine to | 68' SAND | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

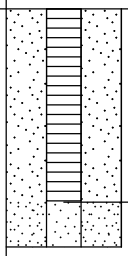


BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS ROGUE RIVER RD.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 7 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 69 | | | | | | medium grained SAND, little Silt, wet. Changing at 68.5 feet to: Dark brown to dark yellowish-brown, very well sorted, fine grained SAND, trace Silt, wet with Silty Clay varves, plastic, cohesive, moist. Changing at 68.6 feet to: Dark yellowish-brown, well sorted, fine to medium grained SAND, little Silt, wet. Changing at 69.9 feet to: NO RECOVERY. | SAND<br>69.9' | |  |
| 70 | 36 | 24/20.4 | 70-72 | 13-19<br>31-50/3" | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium grained SAND, little Silt, wet. Changing at 70.4 feet to: Very dark grayish-brown to dark grayish-brown, well sorted, varved Silty CLAY, plastic, cohesive, moist. Changing at 71.7 feet to: NO RECOVERY. | 70' NO RECOVERY<br>70.4' SAND<br>Silty CLAY<br>71.7' | | Bottom of Well Screen |
| 71 | | | | | | | | | |
| 72 | 37 | 24/16.8 | 72-74 | 42-20<br>19-24 | 0.0 ppm | Brown to grayish-brown, very well sorted, SILT, trace Clay, slightly plastic, cohesive, moist. Changing at 72.6 feet to: Dark yellowish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 73.0 feet to: Brown to yellowish-brown, poorly sorted, fine to coarse grained SAND, some Gravel, moist to wet. Changing at 73.2 feet to: Mottled yellowish-red to light gray to light grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 73.4 feet to: NO RECOVERY. | 72' NO RECOVERY<br>SILT<br>72.6'<br>CLAY & SILT<br>73' | | |
| 73 | | | | | | | 73.2' SAND<br>73.4' Silty CLAY<br>NO RECOVERY | | |
| 74 | 38 | 24/13.2 | 74-76 | 16-22<br>45-50/4" | 0.0 ppm | Mottled yellowish-red to light gray to light grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 74.8 feet to: NO RECOVERY. | 74'<br>Silty CLAY<br>74.8' | | |
| 75 | | | | | | | NO RECOVERY<br>76' | | |
| 76 | 39 | 24/9.6 | 76-78 | 4-32-50 | 0.0 ppm | Yellowish-red, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 76.6 feet to: NO RECOVERY. | Silty CLAY<br>76.6' | | |
| 77 | | | | | | | NO RECOVERY<br>78' | | |
| 78 | 40 | 24/7.2 | 78-80 | 43-50/4" | 0.0 ppm | Yellowish-red, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 78.6 feet to: NO RECOVERY. | Silty CLAY<br>78.6' | | |
| 79 | | | | | | | NO RECOVERY<br>80' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS ROGUE RIVER RD.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 8 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 41 | 24/3.6 | 80-82 | 50/5" | 0.0 ppm | Yellowish-red, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 80.3 feet to: NO RECOVERY. | Silty CLAY 80.3' NO RECOVERY | | |
| 81 | | | | | | | | | |
| 82 | 42 | 24/7.2 | 82-84 | 20-50 | 0.0 ppm | Yellowish-red, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 82.6 feet to: NO RECOVERY. | 82' Silty CLAY 82.6' NO RECOVERY | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/21.6 | 84-86 | 12-33-50/4" | 0.0 ppm | Yellowish-red, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 85.6 feet to: NO RECOVERY. | 84' Silty CLAY 85.6' NO RECOVERY | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/10.8 | 86-88 | 20-50/5" | 0.0 ppm | Yellowish-red, well sorted, Silty CLAY, plastic, cohesive, moist. Changing 86.9 feet to: NO RECOVERY. | 86' Silty CLAY 86.9' NO RECOVERY | | |
| 87 | | | | | | | | | |
| 88 | 45 | 24/4.8 | 88-90 | 50/5" | 0.0 ppm | Mottled yellowish-red to light gray to light grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 88.9 feet to: NO RECOVERY. | 88' Silty CLAY 88.9' NO RECOVERY | | |
| 89 | | | | | | | | | |
| 90 | 46 | 24/10.8 | 90-92 | 23-50/5" | 0.0 ppm | Mottled yellowish-red to light gray to light grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 90.9 feet to: NO RECOVERY. | 90' Silty CLAY 90.9' NO RECOVERY | | |
| 91 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS ROGUE RIVER RD.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** SB-25/MW-25M
**Page:** 9 **of** 9
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 92 | 47 | 24/8.4 | 92-94 | 25-50 | 0.0 ppm | Mottled yellowish-red to light gray to light grayish-brown, well sorted,Silty CLAY, plastic, cohesive, moist. Changing at 92.7 feet to: NO RECOVERY. | 92' Silty CLAY 92.7' NO RECOVERY | | |
| 93 | | | | | | | | | |
| 94 | 48 | 24/3.6 | 94-96 | 36-50/2" | 0.0 ppm | Mottled yellowish-red to light gray to light grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 94.3 feet to: NO RECOVERY. | 94' Silty CLAY 94.3' NO RECOVERY | | |
| 95 | | | | | | | | | |
| 96 | | | | | | Bottom of Borehole at 96.0 Feet | 96' | 3 | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |

**REMARKS**

3. Monitoring well MW-25M was installed in borehole upon completion. Well screen set from 65.0 to 70.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-25/MW-25M

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

# 1855 House Street: Off-Site Borings
## 2805 Rogue River Road, NE
## Belmont, Michigan

**Boring No.:** MW-25S
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-1-18 / 11-9-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | NA |
| **Hammer Wt.:** | 140 lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

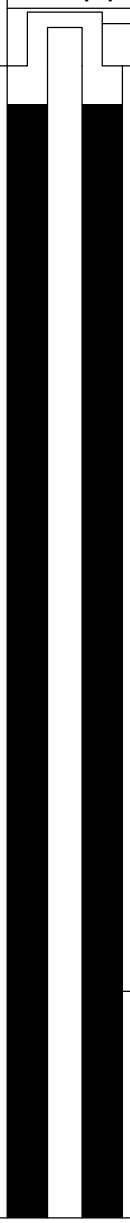
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See SB-25/MW-25M for detailed soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6233552 HOUSE STREET OFF SITE BORINGS ROGUE RIVER RD.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

1855 House Street: Off-Site Borings
2805 Rogue River Road, NE
Belmont, Michigan

**Boring No.:** MW-25S
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Julie Groenleer

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | | | | Top of Well Screen |
| 51 | | | | | | | | | Silica Sand Filter Pack |
| 52 | | | | | | | | | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | Bottom of Borehole at 55.0 Feet | | 1 | Bottom of Well Screen |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

1. Monitoring well MW-25S was installed in borehole upon completion. Well screen set from 49.6 to 54.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-25S

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-26/MW-26D
**Page:** 1 **of** 8
**File No.:** 16.0062335.52
**Check:** John Morehouse

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-8-18 / 11-15-18
**Boring Location:** NW Corner of Rogue River & Jupiter Intersection
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

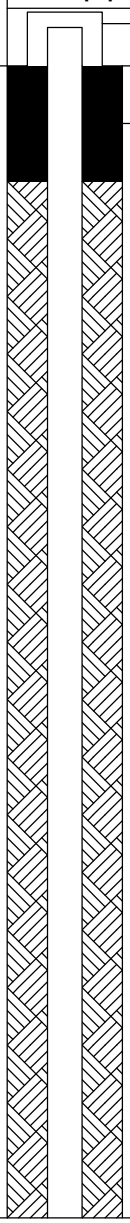
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/16 | 0-2 | 2-1<br>2-1 | 0.0 ppm | Very dark brown, moderately sorted, fine-grained SAND, some Silt, non to slightly cohesive, moist. Changing at 0.7 feet to: Dark yellowish-brown, moderately sorted, fine to medium-grained SAND, some Silt, moist. Changing at 1.3 feet to: NO RECOVERY. | SAND<br>1.3'<br>NO RECOVERY<br>2' | |
| 1 | | | | | | | | |
| 2 | 2 | 24/12 | 2-4 | 2-2<br>3-5 | 0.0 ppm | Dark yellowish-brown, moderately sorted, fine to medium-grained SAND, some Silt, moist. Changing at 2.7 feet to: Brown to pale brown, poorly sorted, GRAVEL, little to some coarse to medium-grained Sand, trace Silt, moist. Changing at 3.0 feet to: NO RECOVERY. | SAND<br>2.7'<br>GRAVEL<br>3'<br>NO RECOVERY<br>4' | |
| 3 | | | | | | | | |
| 4 | 3 | 24/11 | 4-6 | 4-3<br>2-2 | 0.0 ppm | Brown to pale brown, poorly sorted, GRAVEL, little to some coarse to medium-grained Sand, trace Silt, moist. Changing at 4.4 feet to: Brownish-yellow, poorly sorted, fine to medium-grained SAND, trace Silt, moist. Changing at 4.6 feet to: Dark yellowish-brown, poorly sorted, fine to medium-grained SAND, trace Silt. moist. Changing at 4.9 feet to: NO RECOVERY. | GRAVEL<br>4.4'<br>SAND<br>4.9'<br>NO RECOVERY<br>6' | |
| 5 | | | | | | | | |
| 6 | 4 | 24/12 | 6-8 | 2-4<br>10-13 | 0.0 ppm | Dark yellowish-brown, poorly sorted, fine to medium-grained SAND, trace Silt, moist. Changing at 7.0 feet to: NO RECOVERY. | SAND<br>7'<br>NO RECOVERY<br>8' | |
| 7 | | | | | | | | |
| 8 | 5 | 24/16 | 8-10 | 9-11<br>9-8 | 0.0 ppm | Dark yellowish-brown, poorly sorted, medium to coarse-grained SAND, little Gravel, trace Silt, moist. Changing at 9.3 feet to: NO RECOVERY. | SAND<br>9.3'<br>NO RECOVERY<br>10' | |
| 9 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-26/MW-26D
**Page:** 2 **of** 8
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 6 | 24/14 | 10-12 | 5-7<br>5-6 | 0.0 ppm | Dark yellowish-brown, poorly sorted, medium to coarse-grained SAND, little Gravel, trace Silt, moist. Changing at 10.9 feet to: Brown to pale brown, moderately sorted, coarse-grained SAND, some Gravel, trace Silt, moist. Changing at 11.2 feet to: NO RECOVERY. | SAND<br>11.2'<br>NO RECOVERY<br>12' | | |
| 11 | | | | | | | | | |
| 12 | 7 | 24/14 | 12-14 | 5-13<br>23-24 | 0.0 ppm | Dark yellowish-brown, poorly sorted, coarse to medium-grained SAND, little to some Gravel, trace Silt, moist. Changing at 13.2 feet to: NO RECOVERY. | SAND<br>13.2'<br>NO RECOVERY<br>14' | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/18 | 14-16 | 12-19<br>10-8 | 0.0 ppm | Dark yellowish-brown, poorly sorted, coarse to medium-grained SAND, little to some Gravel, trace Silt, moist. Changing at 15.5 feet to: NO RECOVERY. | SAND<br>15.5'<br>NO RECOVERY<br>16' | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/16 | 16-18 | 12-19<br>21-50/5.5" | 0.0 ppm | Dark yellowish-brown, poorly sorted, coarse to medium-grained SAND, little to some Gravel, trace Silt, moist. Changing at 17.2 feet to: Dark yellowish-brown, poorly sorted, coarse to medium-grained SAND, little to some Gravel, trace Silt, wet. Changing at 17.3 feet to: NO RECOVERY. | SAND<br>17.3'<br>NO RECOVERY<br>18' | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/17 | 18-20 | 12-18<br>17-15 | 0.0 ppm | Dark yellowish-brown, poorly sorted, coarse to medium-grained SAND, little to some Gravel, trace Silt, wet. Changing at 18.4 feet to: Strong, brown, poorly sorted, SILT & CLAY, some Sand, non to slightly plastic, cohesive, grading to reddish-brown, moderately well sorted, CLAY & SILT, little Sand, plastic, cohesive, moist. Changing at 19.4 feet to: NO RECOVERY. | SAND<br>18.4'<br>SILT & CLAY grading to CLAY & SILT<br>19.4'<br>NO RECOVERY<br>20' | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/18 | 20-22 | 12-20<br>20-26 | 0.0 ppm | Dark yellowish-brown, poorly sorted, coarse to medium-grained SAND, little to some Gravel, trace Silt, wet. Changing at 20.6 feet to: Reddish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 20.9 feet to: Dark gray, well sorted, Silty CLAY, laminated, plastic, cohesive, moist. Changing at 21.5 feet to: | SAND<br>20.9'<br>Silty CLAY<br>21.5' | | |
| 21 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-26/MW-26D
**Page:** 3 **of** 8
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | NO RECOVERY. | NO RECOVERY (22') | | |
| 22 | 12 | 24/20 | 22-24 | 11-13 17-20 | 0.0 ppm | Dark grayish-brown, poorly sorted, Clayey SAND, little Silt, trace Gravel, slightly plastic, cohesive, moist. Changing at 23.2 feet to: Brown, well sorted, fine to medium-grained SAND, trace Silt, moist to wet. Changing at 23.3 feet to: Dark grayish-brown, poorly sorted, Clayey SAND, little Silt, trace Gravel, slightly plastic, coheisve, moist. Changing at 23.6 feet to: NO RECOVERY. | SAND (23.6') | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/17 | 24-26 | 4-13 20-25 | 0.0 ppm | Grayish-brown to dark grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 25.2 feet to: Dark grayish-brown to grayish-brown, very well sorted, SILT, some fine-grained Sand, slightly cohesive, wet. Changing at 25.4 feet to: NO RECOVERY. | NO RECOVERY (24') SAND (25.2') SILT (25.4') NO RECOVERY (26') | 1 | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/18 | 26-28 | 14-22 23-19 | 0.0 ppm | Dark grayish-brown to grayish-brown, very well sorted, SILT, some fine-grained Sand, slightly cohesive, wet with occuring thin, layers of Silty CLAY, plastic, cohesive, moist. Changing at 27.5 feet to: NO RECOVERY. | Silty CLAY (27.5') | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/24 | 28-30 | 10-16 23-20 | 0.0 ppm | Grayish-brown to dark grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 28.3 feet to: Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 28.9 feet to: Grayish-brown to dark grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 29.2 feet to: Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 29.3 feet to: Grayish-brown to dark grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 29.6 feet to: Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 29.8 feet to: Grayish-brown to dark grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 29.9 feet to: Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. | NO RECOVERY (28') SAND (28.3') Silty CLAY (28.9') SAND (29.2') Silty CLAY (29.3') SAND (29.6') Silty CLAY (29.8') SAND (29.9') Silty CLAY (30') CLAY & SILT (31.8') | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/22 | 30-32 | 8-20 20-27 | 0.0 ppm | | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/23 | 32-34 | 9-16 24-34 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, plastic, cohesive, moist. Changing at 31.8 feet to: NO RECOVERY. Dark gray, poorly sorted, SILT & CLAY, some Sand, plastic, cohesive, moist. changing at 32.4 feet to: Grayish-brown to | NO RECOVERY (32') SILT & CLAY (32.4') SAND (32.5') SILT & CLAY (32.9') SAND (33.2') | | |
| 33 | | | | | | | | | |

**REMARKS**

1. Groundwater was encountered at approximately 24.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-26/MW-26D
**Page:** 4 **of** 8
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 34 | 18 | 24/18 | 34-36 | 12-14 27-42 | 0.0 ppm | dark grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 32.5 feet to: Dark gray, poorly sorted, SILT & CLAY, some Sand, plastic, cohesive, moist. Changing at 32.9 feet to: Grayish-brown to dark grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 33.2 feet to: Dark gray, poorly sorted, SILT & CLAY, some Sand, plastic, coheisve, moist. Changing at 33.9 feet to: NO RECOVERY. | SILT & CLAY; 33.9'; 34' NO RECOVERY; SILT; 34.8'; Silty CLAY | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/22 | 36-38 | 2-13 23-19 | 0.0 ppm | Dark grayish-brown to brown, well sorted, SILT, little fine-grained Sand, non-plastic, cohesive, wet. Changing at 34.8 feet to: Dark brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 35.5 feet to: Dark grayish-brown to grayish-brown, well sorted, fine-grained SAND, some Silt, non-plastic, cohesive, wet. Changing at 35.9 feet to: NO RECOVERY. | 35.5'; SAND; 35.9'; 36' NO RECOVERY; 36.4' Silty CLAY; 36.6' Alternating Silty CLAY and SAND; SAND | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/24 | 38-40 | 8-14 19-23 | 0.0 ppm | Dark brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 36.4 feet to: Alternating seams of dark brown, well sorted, Silty CLAY and grayish-brown, well sorted, fine-grained SAND, moist. Changing at 36.6 feet to: Dark grayish-brown to grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 37.5 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 37.8 feet to: NO RECOVERY. | 37.5'; Silty CLAY; 37.8'; 38' NO RECOVERY; Silty CLAY | | Bentonite/Grout |
| 39 | | | | | | | | | |
| 40 | 21 | 24/24 | 40-42 | 5-13 21-36 | 0.0 ppm | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. | | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/24 | 42-44 | 9-19 27-45 | 0.0 ppm | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/24 | 44-46 | 11-17 30-50/5.5" | 0.0 ppm | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-26/MW-26D
**Page:** 5 **of** 8
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Silty CLAY | | |
| 46 | 24 | 24/18 | 46-48 | 3-16 29-27 | 0.0 ppm | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 47.3 feet to: Dark yellowish-brown, poorly sorted, SILT & CLAY, some Sand, moderately plastic, cohesive, moist. Changing at 47.4 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 47.5 feet to: NO RECOVERY. | 47.3' SILT & CLAY 47.4' Silty CLAY 47.5' NO RECOVERY 48' | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/24 | 48-50 | 10-15 28-29 | 0.0 ppm | Alernating seams of dark yellowish-brown, well sorted, fine to medium-grained Sand, trace Silt, wet, and dark yellowish-brown, poorly sorted, SILT & CLAY, some Sand, moderately plastic, cohesive, moist. Changing at 49.8 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. | Alternating SAND and Silty CLAY 49.8' | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/23 | 50-52 | 11-25 37-48 | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 50.4 feet to: Dark yellowish-brown, moderately well sorted, fine to medium-grained SAND, some Silt, wet. Changing at 50.5 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 50.7 feet to: Dark yellowish-brown, moderately well sorted, fine to medium-grained SAND, some Silt, wet. Changing at 51.3 feet to: Grayish-brown to light grayish-brown, well sorted, fine-grained SAND, some Silt, wet. Changing at 51.9 feet to: NO RECOVERY. Grayish-brown to light grayish-brown, well sorted, fine-grained SAND, some Silt, wet; very thin lenses of Silty Clay at 52.5 feet and 52.9 feet. Changing at 53.0 feet to: NO RECOVERY. | 50' Silty CLAY SAND 50.5' 50.7' Silty CLAY SAND 51.9' | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/12 | 52-54 | 7-8 9-18 | 0.0 ppm | | 52' NO RECOVERY SAND/lenses of Silty Clay 53' | | |
| 53 | | | | | | | NO RECOVERY 54' | | |
| 54 | 28 | 24/20 | 54-56 | 45-36-50/6" | 0.0 ppm | Grayish-brown to light grayish-brown, well sorted, fine-grained SAND, some Silt, wet. Changing at 54.8 feet to: Dark grayish-brown to light grayish-brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 55.7 feet to: NO RECOVERY. | SAND 54.8' SILT & CLAY 55.7' | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/20 | 56-58 | 3-11 20-21 | 0.0 ppm | Dark yellowish-brown to grayish-brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, plastic, cohesive, moist. | NO RECOVERY 56' 56.2' SILT & CLAY SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-26/MW-26D
**Page:** 6 **of** 8
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 57 | | | | | | Changing at 56.2 feet to: Yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Gravel, trace Silt, wet. Changing at 57.6 feet to: NO RECOVERY. | SAND<br>57.6'<br>NO RECOVERY | | |
| 58 | 30 | 24/13 | 58-60 | 5-1<br>7-34 | 0.0 ppm | Yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Gravel, trace Silt, wet. Changing at 58.8 feet to: Brown, poorly sorted, fine to coarse-grained SAND, little Gravel, trace Silt, wet. Changing at 59.1 feet to: NO RECOVERY. | 58'<br>SAND<br>59.1'<br>NO RECOVERY | | |
| 59 | | | | | | | | | |
| 60 | 31 | 24/22 | 60-62 | 31-44<br>44-42 | 0.0 ppm | Brown to dark yellowish-brown to yellowish-brown, poorly sorted, fine to coarse-grained SAND, little Gravel, trace Silt, wet. Changing at 61.8 feet to: NO RECOVERY. | 60'<br>SAND<br>61.8' | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/20 | 62-64 | 3-16<br>36-50 | 0.0 ppm | Brown to dark yellowish-brown to yellowish-brown, poorly sorted, fine to coarse-grained SAND, little Gravel, trace Silt, wet. Changing at 62.2 feet to: Dark yellowish-brown, well sorted, fine-grained SAND, some Silt, slightly cohesive, moist to wet. Changing at 62.8 feet to: Brown to dark yellowish-brown to yellowish-brown, poorly sorted, fine to coarse-grained SAND, little Gravel, trace Silt, wet. Changing at 63.7 feet to: NO RECOVERY. | 62' NO RECOVERY<br>SAND<br>63.7' | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/16 | 64-66 | 11-30<br>39-50/5.5" | 0.0 ppm | Dark yellowish-brown, moderately well sorted, fine to medium-grained SAND, trace Silt, trace Gravel, wet. Changing at 65.3 feet to: NO RECOVERY. | 64' NO RECOVERY<br>SAND<br>65.3' | | |
| 65 | | | | | | | NO RECOVERY<br>66' | | |
| 66 | 34 | 24/7 | 66-68 | 3-18-50/5" | 0.0 ppm | Dark yellowish-brown, moderately well sorted, fine to medium-grained SAND, trace Silt, trace Gravel, wet. Changing at 66.6 feet to: NO RECOVERY. | SAND<br>66.6'<br>NO RECOVERY | | |
| 67 | | | | | | | | | |
| 68 | 35 | 24/12 | 68-70 | 26-50/5.5" | 0.0 ppm | Yellowish-brown, moderately well sorted, | 68'<br>SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** SB-26/MW-26D

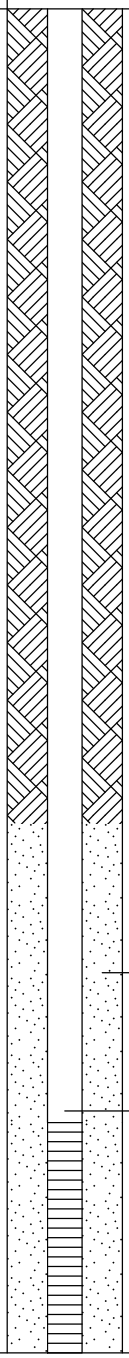
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-26/MW-26D
**Page:** 7 **of** 8
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 69 | | | | | | fine to medium-grained SAND, trace Silt, trace Gravel, wet. Changing at 68.4 feet to: Yellowish-brown, moderately well sorted, coarse-grained SAND, trace Silt, wet. Changing at 68.5 feet to: Dark yellowish-brown, moderately well sorted, fine to medium-grained SAND, trace Silt, trace Gravel, wet. Changing at 68.6 feet to: NO RECOVERY. | 68.6' SAND; NO RECOVERY | |
| 70 | 36 | 24/10 | 70-72 | 18-38 45-50/5" | 0.0 ppm | Dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, trace Gravel, trace Silt, wet. Changing at 70.8 feet to: NO RECOVERY. | 70' SAND; 70.8' NO RECOVERY | |
| 71 | | | | | | | | |
| 72 | 37 | 24/22 | 72-74 | 17-34 36-40 | 0.0 ppm | Dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, trace Gravel, trace Silt, wet. Changing at 72.7 feet to: Yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Silt, trace Gravel, moist. Changing at 72.8 feet to: Dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, trace Gravel, trace Silt, grading coarser, wet. Changing 73.8 feet to: NO RECOVERY. | 72' SAND; 73.8' NO RECOVERY | |
| 73 | | | | | | | | |
| 74 | 38 | 24/23 | 74-76 | 13-20 28-33 | 0.0 ppm | Dark grayish-brown, poorly sorted, coarse to medium-grained SAND, trace Gravel, trace Silt, wet. Changing at 75.7 feet to: Dark grayish-brown to dark brown, poorly sorted, fine-grained SAND, some Silt, trace Clay, non to slightly plastic, cohesive, moist. Changing at 75.8 feet to: Dark grayish-brown, poorly sorted, coarse to medium-grained SAND, trace Gravel, trace Silt, wet. Changing at 75.9 feet to: NO RECOVERY. | 74' NO RECOVERY; SAND | |
| 75 | | | | | | | | |
| 76 | 39 | 24/17 | 76-78 | 30-48-50/4" | 0.0 ppm | Dark grayish-brown, poorly sorted, coarse to medium-grained SAND, trace Gravel, trace Silt, wet. Changing at 77.4 feet to: NO RECOVERY. | 75.9' 76' NO RECOVERY; SAND | |
| 77 | | | | | | | 77.4' NO RECOVERY | |
| 78 | 40 | 24/22 | 78-80 | 12-46-50/4" | 0.0 ppm | Dark grayish-brown, poorly sorted, coarse to medium-grained SAND, trace Gravel, trace Silt, wet. Changing at 78.3 feet to: Dark grayish-brown, poorly sorted, fine to medium-grained SAND, little Gravel, little Silt, trace Clay, slightly plastic, cohesive, moist. Changing at 79.2 feet to: Dark grayish-brown, poorly sorted, coarse to medium-grained SAND, trace Gravel, trace Silt, wet. Changing at 79.8 feet to: NO | 78' SAND | |
| 79 | | | | | | | 79.8' 80' NO | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 2/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** SB-26/MW-26D
**Page:** 8 **of** 8
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 41 | 24/17 | 80-82 | 10-32-50 | 0.0 ppm | RECOVERY. Dark grayish-brown, moderately well sorted, fine to medium-grained SAND, trace Silt, moist to wet. Changing at 81.4 feet to: NO RECOVERY. | RECOVERY SAND | | 2-Inch Dia. 5-Foot PVC Screen (0.010" Slot) |
| 81 | | | | | | | 81.4' NO RECOVERY | | |
| 82 | 42 | 24/14 | 82-84 | 12-27 45-50/3" | 0.0 ppm | Light yellowish-brown, poorly sorted, fine to medium-grained SAND, some Silt, little Gravel, little Clay, cohesive, moist. Changing at 83.2 feet to: NO RECOVERY. | 82' SAND | | |
| 83 | | | | | | | 83.2' NO RECOVERY | | Bottom of Well Screen |
| 84 | 43 | 24/10 | 84-86 | 26-50/3" | 0.0 ppm | Dark yellowish-brown, poorly sorted, fine to medium-grained SAND, some Silt, little Gravel, little Clay, cohesive, moist. Changing at 84.8 feet to: NO RECOVERY. | 84' SAND | | |
| 85 | | | | | | | 84.8' NO RECOVERY | | |
| 86 | 44 | 24/12 | 86-88 | 30-50/3" | 0.0 ppm | Dark grayish-brown, poorly sorted, SILT & CLAY, some Sand, trace Gravel, moderately plastic, cohesive, moist. Changing at 87.0 feet to: NO RECOVERY. | 86' SILT & CLAY | | |
| 87 | | | | | | | 87' NO RECOVERY | | |
| 88 | | | | | | Bottom of Borehole at 88.0 Feet | 88' | 2 | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |

**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from approximately 78.0 to 83.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 2/27/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-26M
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** John Morehouse

**Contractor:** Stearns Drilling Company
**Foreman:** Darrell Krause
**Logged by:** John Morehouse
**Date Start/Finish:** 12-10-18 / 12-11-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

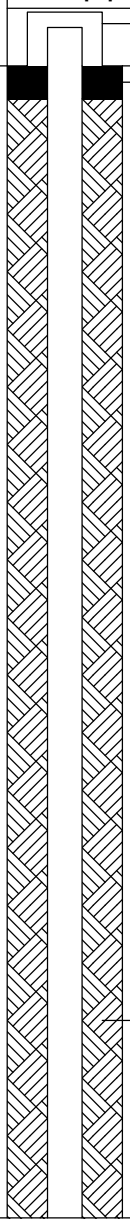
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See SB-26/MW-26D boring log for sample description and classification. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-26M

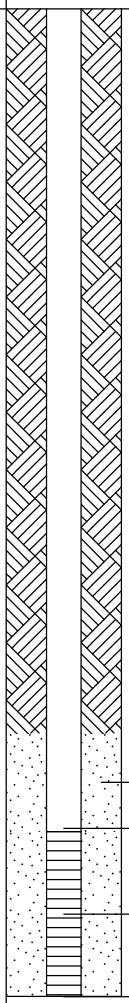
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-26M
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** John Morehouse

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | | | |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | | | |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |
| 65 | | | | | | Bottom of Borehole at 65.0 Feet | | 1 |
| 66 | | | | | | | | |
| 67 | | | | | | | | |
| 68 | | | | | | | | |
| 69 | | | | | | | | |
| 70 | | | | | | | | |
| 71 | | | | | | | | |
| 72 | | | | | | | | |
| 73 | | | | | | | | |
| 74 | | | | | | | | |
| 75 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 60.0 to 65.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-26M

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 3/1/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** MW-26S
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** John Morehouse

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 11-12-18 / 11-12-18
**Boring Location:** NW Corner of Intersection
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

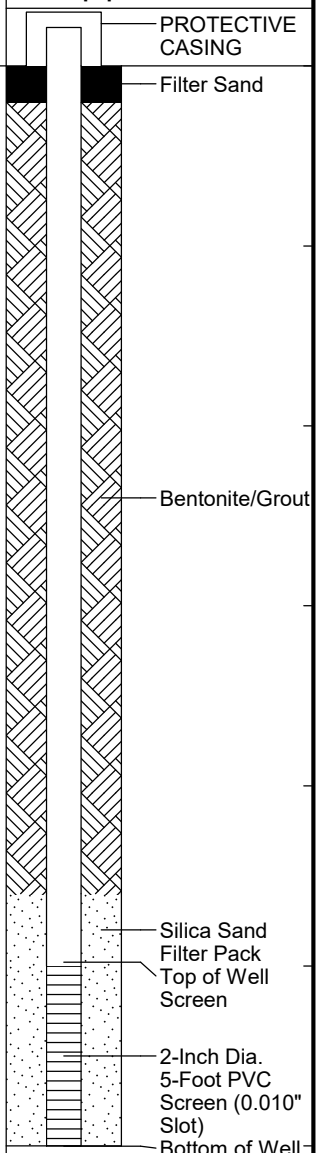
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–30 | | | | | | See SB-26/MW-26D boring log for sample description and classification. | | |
| 30–31 | | | | | | Bottom of Borehole at 30.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 25.0 to 30.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-26S

BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 2/27/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW27A
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-20-19 / 6-20-19
**Boring Location:** 6390 Belmont Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–25 | | | | | | See HS-MW27E boring log for sample description and classification. | | |
| 26 | | | | | | Bottom of Borehole at 26.0 Feet | | 1 |
| 27–29 | | | | | | | | |

Gamma (API-GR) 0 20 40 60 80

Well Diagram: PROTECTIVE CASING

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 21.1 to 25.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27A

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW27B
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-20-19 / 6-20-19
**Boring Location:** 6390 Belmont Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

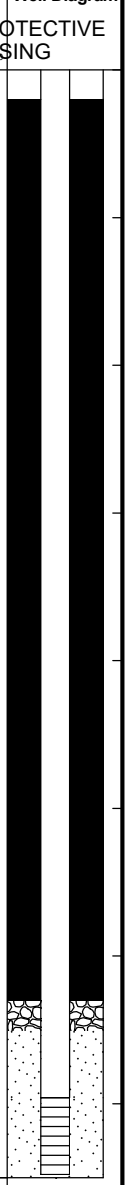
| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–37 | | | | | | See HS-MW27E boring log for sample description and classification. | | |
| 38 | | | | | | Bottom of Borehole at 37.5 Feet | | 1 |

Gamma (API-GR) 0 20 40 60 80

Well Diagram




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 34.8 to 37.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27B

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW27C
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-20-19 / 6-20-19
**Boring Location:** 6390 Belmont Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–45 | | | | | | See HS-MW27E boring log for sample description and classification. | | |
| 46–47 | | | | | | Bottom of Borehole at 45.5 Feet | | 1 |

Gamma (API-GR): 0, 20, 40, 60, 80

Well Diagram: PROTECTIVE CASING

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 40.8 to 45.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27C

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW27D
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-19-19 / 6-19-19
**Boring Location:** 6390 Belmont Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW27E boring log for sample description and classification. | | | | PROTECTIVE CASING |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |

Gamma (API-GR): 0, 20, 40, 60, 80

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW27D
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | | | | | | | |
| 34 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 37 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | | | | | | | | | | |
| 41 | | | | | | | | | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | Bottom of Borehole at 63 Feet | | 1 | | |
| 64 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 59.0 to 63.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW27E
**Page:** 1 **of** 4
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-17-19 / 6-19-19
**Boring Location:** 6390 Belmont Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

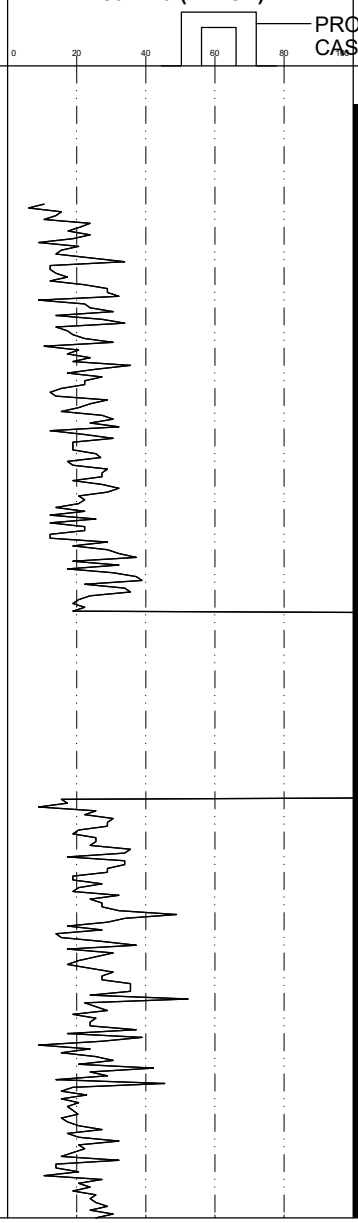
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

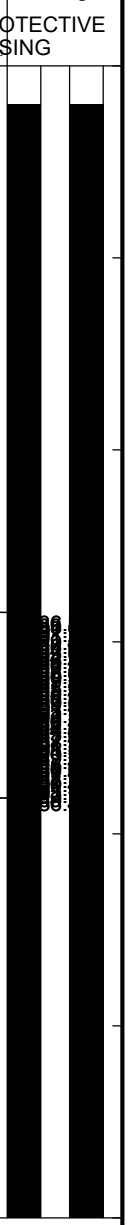
**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–7 | | 1 | 120/89 | | | Very dark, grayish-brown, poorly sorted, SILT, some fine Sand, trace Gravel, moist. Changing at 1.0 feet to: Dark yellowish-brown, poorly sorted, SILT, some fine Sand, trace Clay, slightly plastic, slightly coheisve, moist. Changing at 1.5 feet to: Dark brown to dark yellowish-brown, moderately sorted, fine to medium SAND, little Silt, trace Gravel, moist. Changing at 6.0 feet to: Dark yellowish-brown, moderately sorted, fine to medium SAND, trace Silt, trace Gravel, moist. Changing at 7.0 feet to: Yellowish-brown, well sorted, fine to medium SAND, trace Silt, moist. Changing at 7.4 feet to: NO RECOVERY. | SILT<br>1.5'<br>SAND<br>7.4'<br>NO RECOVERY | |
| 8–14 | | 2 | 120/70 | | | Dark yellowish-brown, poorly sorted, fine to coarse SAND, some Gravel, trace Silt, moist. Changing at 15.0 feet to: Yellowish-brown, moderately well sorted, fine to medium SAND, trace Silt, trace Gravel (silty clay on large gravel), moist. Changing at 15.8 feet to: NO RECOVERY. | 10'<br>SAND<br>15.8'<br>NO RECOVERY | |
| 15–29 | | 3 | 120/115 | | | Yellowish-brown, moderately well sorted, fine to medium SAND, trace Silt, trace Gravel (silty clay on large gravel), moist. Changing at 25.4 feet to: Yellowish-brown, poorly sorted, fine to coarse SAND, some Gravel, trace Silt, wet. Changing at 27.1 feet to: Hard, dark yellowish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 28.6 feet to: Hard, dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 29.6 feet to: NO RECOVERY. | 20'<br>SAND<br>27.1'<br>Silty CLAY<br>29.6'<br>30' | 1 |

**Gamma (API-GR)**




**Well Diagram**




**REMARKS**

1. Groundwater sample was collected from approximately 21.0 to 25.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

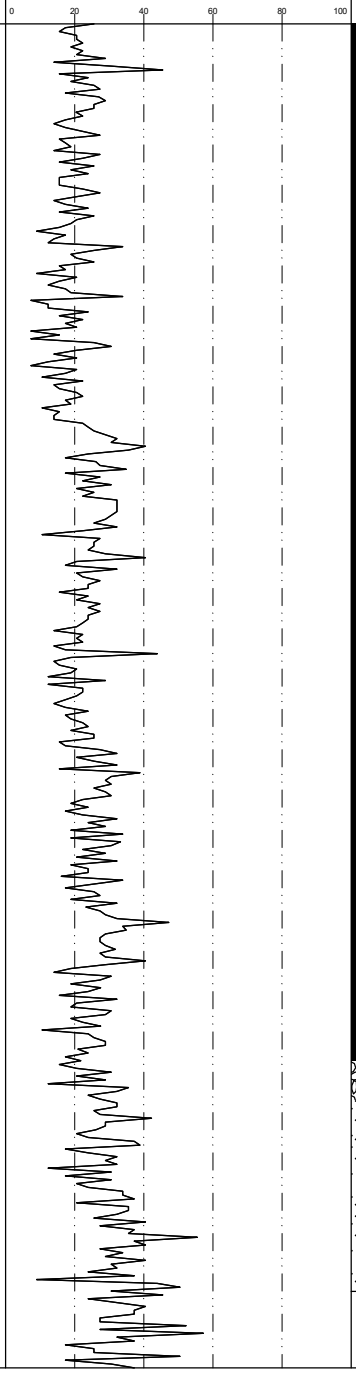
**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

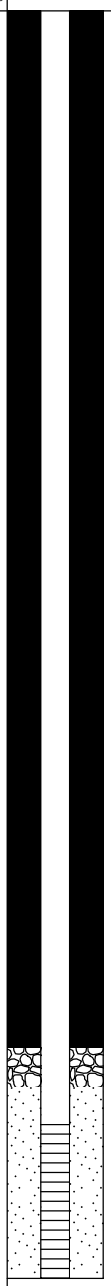
**Boring No.:** HS-MW27E
**Page:** 2 **of** 4
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31–34 | | 4 | 120/120 | | | Hard, dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 33.7 feet to: Grayish-brown to brown, poorly sorted, fine to coarse SAND, little Silt, trace Gravel, moist to wet. Changing at 36.4 feet to: Hard, dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 36.9 feet to: Grayish-brown to brown, poorly sorted, fine to medium SAND, little Silt, trace Gravel, moist to wet. Changing at 37.0 feet to: Dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 39.8 feet to: NO RECOVERY. | NO RECOVERY; Silty CLAY; 33.7' SAND; 36.4' Silty CLAY; 36.9' SAND; 37' Silty CLAY | 2 |
| 40–45 | | 5 | 120/120 | | | Brown, well sorted, fine to medium SAND, little Silt, lightly cohesive, wet. Changing at 45.6 feet to: Hard, dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, coheisve, moist. Changing at 48.8 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist, occasional very thin fine Sand, moist. | 39.8' NO RECOVERY; 40' SAND; 45.6' Silty CLAY | 3 |
| 50–60 | | 6 | 120/120 | | | Brown, well sorted, fine to medium SAND, little Silt, lightly cohesive, wet. Changing at 51.1 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 51.5 feet to: Brown, well sorted, fine to medium SAND, little Silt, lightly cohesive, wet. Changing at 52.9 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 53.5 feet to: Brown, well sorted, fine to medium SAND, little Silt, lightly cohesive, wet. Changing at 54.8 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. | 50' SAND; 51.1' Silty CLAY; 51.5' SAND; 52.9' Silty CLAY; 53.5' SAND; 54.8' Silty CLAY | 4 |
| 60–64 | | 7 | 120/112 | | | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 60.6 feet to: Brown, well sorted, fine to medium SAND, little Silt, lightly cohesive, wet. Changing at 63.8 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 67.8 feet to: Alternating layers of dark | 60.6' SAND; 63.8' Silty CLAY | 5 |

**Gamma (API-GR)**




**Well Diagram**



**REMARKS**

2. Groundwater sample was collected from approximately 34.0 to 38.0 feet below ground surface and submitted for analytical laboratory testing.
3. Groundwater sample was collected from approximately 41.0 to 45.0 feet below ground surface and submitted for analytical laboratory testing.
4. Groundwater sample was collected from approximately 52.0 to 56.0 feet below ground surface and submitted for analytical laboratory testing.
5. Groundwater sample was collected from approximately 60.0 to 64.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27E

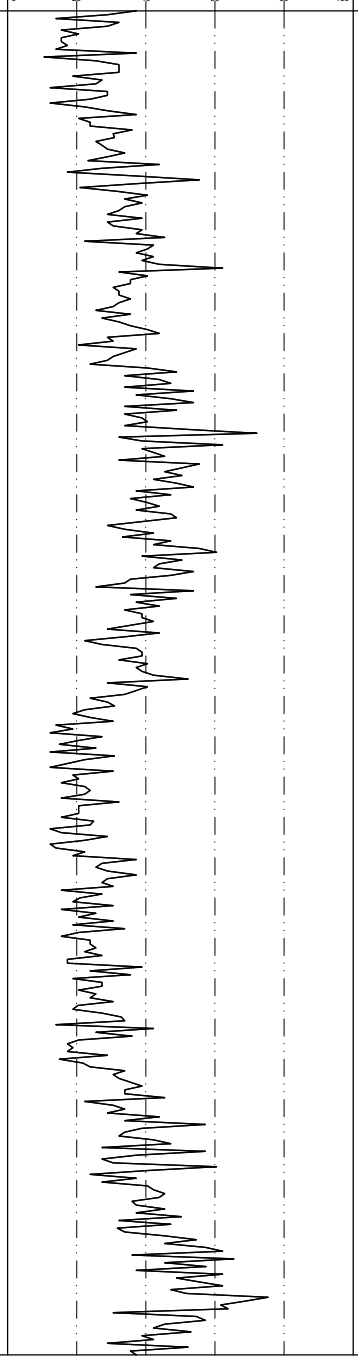
COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW27E
**Page:** 3 **of** 4
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 66–69 | | | | | | grayish-brown, well sorted, Silty CLAY, plastic, cohesive, and brown moderate sorted fine to medium SAND, little Silt, moist. Changing at 68.1 feet to: Dark grayish-brown, well sorted, Silty CLAY, well sorted, Silty CLAY, plastic, cohesive moist. Changing at 69.3 feet to: NO RECOVERY. | Silty CLAY | | | |
| 69.3' | | | | | | | NO RECOVERY | | | |
| 70–71 | | 8 | 120/112 | | | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 79.3 feet to: NO RECOVERY. | Silty CLAY | | | |
| 79.3' | | | | | | | NO RECOVERY | | | |
| 80–81 | | 9 | 120/120 | | | Brown, well sorted, fine to medium SAND, little Silt, lightly cohesive, moist. Changing at 80.3 feet to: Dark brown to dark yellowish-brown, poorly sorted, Silty CLAY, plastic, cohesive, moist. | SAND | | | |
| 82–89 | | | | | | | Silty CLAY | | | |
| 90–99 | | 10 | 120/120 | | | Reddish-brown, moderately sorted, Silty CLAY (possible Red Beds), plastic, cohesive, moist. | | | | |




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27E

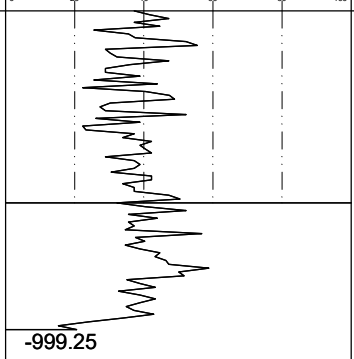
COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW27E
**Page:** 4 **of** 4
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 101–104 | | 11 | 60/60 | | | Reddish-brown, moderately sorted, Silty CLAY (possible Red Beds), plastic, cohesive, moist. Changing at 103.8 feet to: White GYPSUM, fractured. | Silty CLAY<br>103.8'<br>GYPSUM<br>105' | | | |
| 105 | | | | | | Bottom of Borehole at 105.0 Feet | | 6 | -999.25 | |




**REMARKS**

6. Monitoring well was installed in borehole upon completion. Well screen set from 59.0 to 63.0 feet below surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW27E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28A
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-11-19 / 6-12-19
**Boring Location:** 6272 Belshire Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–42 | | | | | | See HS-MW28E boring log for sample description and classification. | | |
| 43 | | | | | | Bottom of Borehole at 42.5 Feet | | 1 |

Gamma (API-GR): 0, 20, 40, 60, 80

Well Diagram: PROTECTIVE CASING

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 37.5 to 42.1 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28A

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28B
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-25-19 / 6-25-19
**Boring Location:** 6272 Belshire Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–46 | | | | | | See HS-MW28E boring log for sample description and classification. | | |
| 47 | | | | | | Bottom of Borehole at 47.0 Feet | | 1 |
| 48 | | | | | | | | |

Gamma (API-GR) 0 20 40 60 80

Well Diagram: PROTECTIVE CASING

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 41.9 to 46.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28B

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28C
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-25-19 / 6-25-19
**Boring Location:** 6272 Belshire Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–52 | | | | | | See HS-MW28E boring log for sample description and classification. | | |
| 53–54 | | | | | | Bottom of Borehole at 52.5 Feet | | 1 |

Gamma (API-GR): 0, 20, 40, 60, 80

Well Diagram: PROTECTIVE CASING

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 47.5 to 52.1 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28C

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28D
**Page:** 1 **of** 3
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-11-19 / 6-11-19
**Boring Location:** 6272 Belshire Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-28E boring log for sample description and classification. | | | | PROTECTIVE CASING |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | | | | | | | |
| 34 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 37 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | | | | | | | | | | |
| 41 | | | | | | | | | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28D
**Page:** 2 **of** 3
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | | | | | | | | | | |
| 66 | | | | | | | | | | |
| 67 | | | | | | | | | | |
| 68 | | | | | | | | | | |
| 69 | | | | | | | | | | |
| 70 | | | | | | | | | | |
| 71 | | | | | | | | | | |
| 72 | | | | | | | | | | |
| 73 | | | | | | | | | | |
| 74 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 76 | | | | | | | | | | |
| 77 | | | | | | | | | | |
| 78 | | | | | | | | | | |
| 79 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 81 | | | | | | | | | | |
| 82 | | | | | | | | | | |
| 83 | | | | | | | | | | |
| 84 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 86 | | | | | | | | | | |
| 87 | | | | | | | | | | |
| 88 | | | | | | | | | | |
| 89 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 91 | | | | | | | | | | |
| 92 | | | | | | | | | | |
| 93 | | | | | | | | | | |
| 94 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 96 | | | | | | | | | | |
| 97 | | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28D
**Page:** 3 **of** 3
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 98 | | | | | | | | | | |
| 99 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 101 | | | | | | | | | | |
| 102 | | | | | | | | | | |
| 103 | | | | | | | | | | |
| 104 | | | | | | | | | | |
| 105 | | | | | | | | | | |
| 106 | | | | | | | | | | |
| 107 | | | | | | | | | | |
| 108 | | | | | | | | | | |
| 109 | | | | | | | | | | |
| 110 | | | | | | Bottom of Borehole at 110.0 Feet | | 1 | | |
| 111 | | | | | | | | | | |
| 112 | | | | | | | | | | |
| 113 | | | | | | | | | | |
| 114 | | | | | | | | | | |
| 115 | | | | | | | | | | |
| 116 | | | | | | | | | | |
| 117 | | | | | | | | | | |
| 118 | | | | | | | | | | |
| 119 | | | | | | | | | | |
| 120 | | | | | | | | | | |
| 121 | | | | | | | | | | |
| 122 | | | | | | | | | | |
| 123 | | | | | | | | | | |
| 124 | | | | | | | | | | |
| 125 | | | | | | | | | | |
| 126 | | | | | | | | | | |
| 127 | | | | | | | | | | |
| 128 | | | | | | | | | | |
| 129 | | | | | | | | | | |
| 130 | | | | | | | | | | |
| 131 | | | | | | | | | | |
| 132 | | | | | | | | | | |
| 133 | | | | | | | | | | |
| 134 | | | | | | | | | | |
| 135 | | | | | | | | | | |
| 136 | | | | | | | | | | |
| 137 | | | | | | | | | | |
| 138 | | | | | | | | | | |
| 139 | | | | | | | | | | |
| 140 | | | | | | | | | | |
| 141 | | | | | | | | | | |
| 142 | | | | | | | | | | |
| 143 | | | | | | | | | | |
| 144 | | | | | | | | | | |
| 145 | | | | | | | | | | |
| 146 | | | | | | | | | | |
| 147 | | | | | | | | | | |
| 148 | | | | | | | | | | |
| 149 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 80.6 to 85.2 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28E
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-5-19 / 6-11-19
**Boring Location:** 6272 Belshire Ave. NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

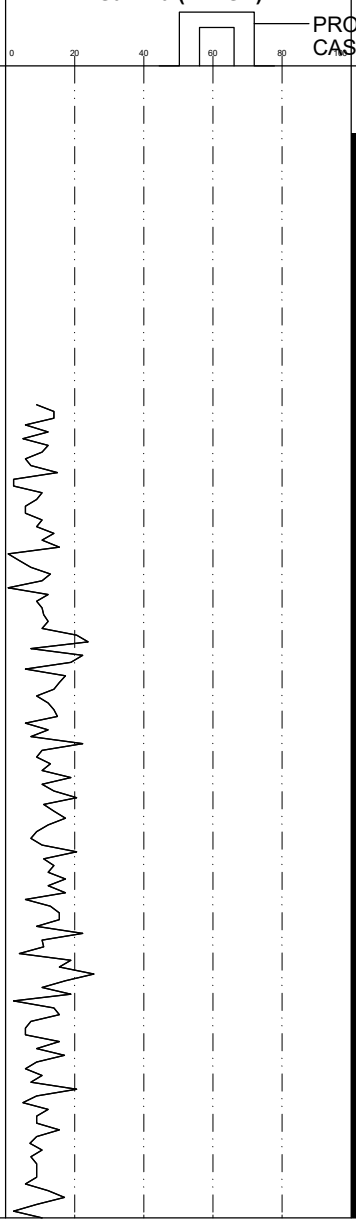
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

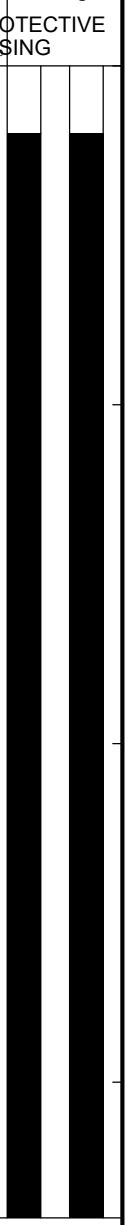
**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0–2.5 | | 1 | 120/30 | | | Dark yellowish-brown, poorly sorted, fine to coarse SAND, some Gravel, trace Silt, moist. Changing at 1.2 feet to: Dark yellowish-brown, well sorted, fine to medium SAND, trace Silt, moist. Changing at 1.4 feet to: Yellowish-brown, poorly sorted, fine to coarse SAND, some Gravel, trace Silt, moist. Changing at 2.5 feet to: NO RECOVERY. | SAND | |
| 2.5–10 | | | | | | | NO RECOVERY | |
| 10–14.6 | | 2 | 120/118 | | | Yellowish-brown grading to dark yellowish-brown, moderately sorted, fine to medium SAND, trace Gravel, trace Silt, grading coarser, moist. Changing at 12.6 feet to: Dark yellowish-brown, poorly sorted, fine to coarse SAND, little Gravel, trace Silt, moist. Changing at 14.6 feet to: Dark grayish-brown, poorly sorted, SILT, little Sand, trace Clay, trace Gravel, non-plastic, slightly cohesive, moist around cobble. Changing at 15.0 feet to: Yellowish-brown, well sorted, brown, well sorted, fine to medium SAND, trace Silt, moist. Changing at 19.8 feet to: NO RECOVERY. | SAND | |
| 14.6–15 | | | | | | | SILT | |
| 15–16 | | | | | | | SAND | |

**Gamma (API-GR)**




**Well Diagram**



**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

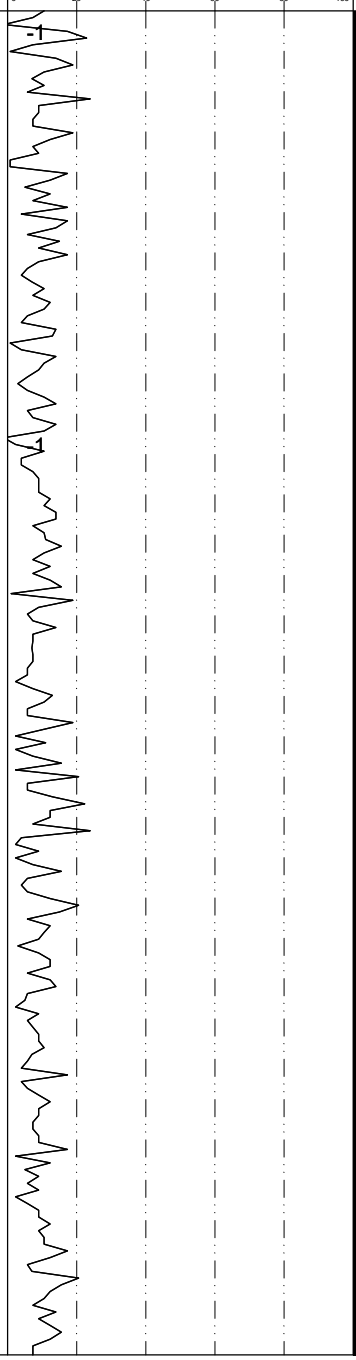
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28E
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | 3 | 120/101 | | | Yellowish-brown, well sorted, fine to medium SAND, trace Silt, trace Gravel, moist. Changing at 28.4 feet to: NO RECOVERY. | 19.8' 20' NO RECOVERY SAND | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | 28.4' NO RECOVERY | |
| 29 | | | | | | | | |
| 30 | | 4 | 120/118 | | | Pale brown to light yellowish-brown, well sorted, fine to medium SAND, trace Silt, moist. Changing at 39.8 feet to: NO RECOVERY. | 30' SAND | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

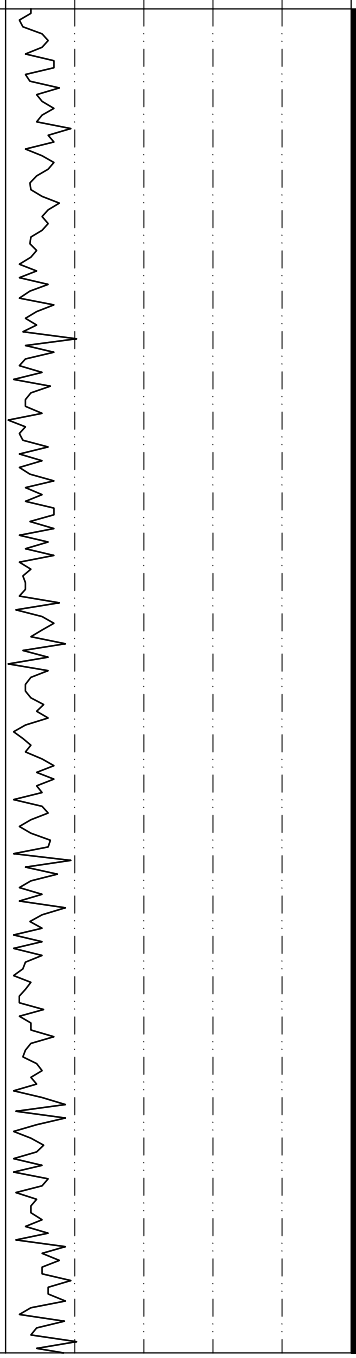
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28E
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 37 | | | | | | | SAND | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | 5 | 120/41 | | | Pale brown to light yellowish-brown, well sorted, fine to medium SAND, trace Silt, trace Gravel, moist. Changing at 40.5 feet to: Yellowish-brown, poorly sorted, fine to coarse SAND, some Gravel, trace Silt, moist to wet. Changing at 41.5 feet to: Yellowish-brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 42.0 feet to: Dark yellowish-brown, poorly sorted, GRAVEL, little coarse Sand, trace Silt, wet. Changing at 43.4 feet to: NO RECOVERY. | 39.8' 40' NO RECOVERY SAND | |
| 41 | | | | | | | | |
| 42 | | | | | | | 42' GRAVEL | 1 |
| 43 | | | | | | | 42.9' SAND 43.4' NO RECOVERY | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | 6 | 120/115 | | | Yellowish-brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 52.5 feet to: Grayish-brown, poorly sorted, Sandy CLAY, little Silt, moderately plastic, cohesive, moist to wet. Changing at 59.6 feet to: NO RECOVERY. | 50' SAND | |
| 51 | | | | | | | | 2 |
| 52 | | | | | | | 52.5' CLAY & SILT | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | 56.4' | |

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

1. Groundwater sample was collected from approximately 42.0 to 44.0 feet below ground surface and submitted for analytical laboratory testing.
2. Groundwater sample was collected from approximately 51.0 to 53.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

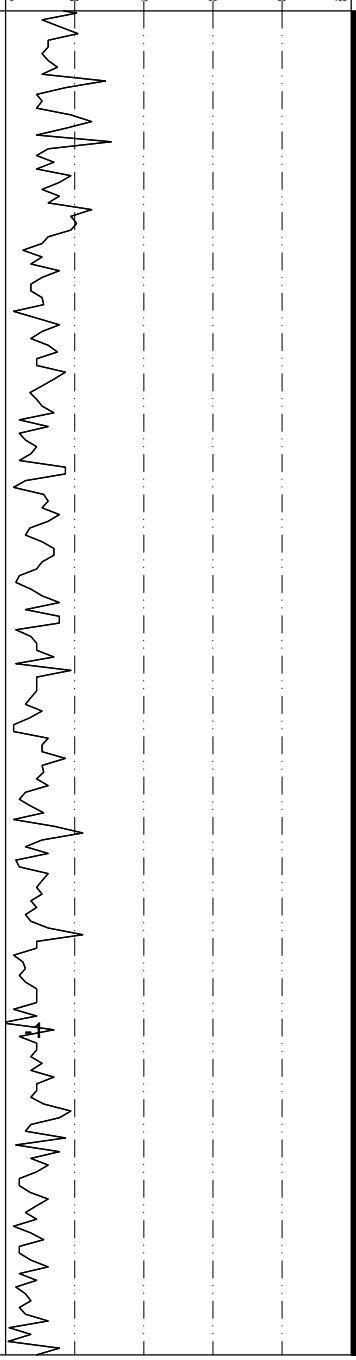
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28E
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 57 | | | | | | | Sandy CLAY | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | 7 | 120/74 | | | Brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 60.7 feet to: Brown, moderately well sorted, SILT, some fine Sand, non-plastic, moderately cohesive, wet. Changing at 60.9 feet to: Brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 61.7 feet to: Brown, moderately well sorted, SILT, some fine Sand, non-plastic, moderately cohesive, wet. Changing at 62.0 feet to: Brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 62.5 feet to: Dark yellowish-brown, poorly sorted, fine to coarse SAND, little Gravel, trace Silt, wet. Changing at 63.3 feet to: Brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 63.8 feet to: Dark yellowish-brown, poorly sorted, GRAVEL, little fine to coarse Sand, trace Silt, wet. Changing at 63.9 feet to: Brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 64.6 feet to: Dark yellowish-brown, poorly sorted, GRAVEL, little fine to coarse Sand, trace Silt, wet. Changing at 65.1 feet to: Brown, well sorted, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 66.2 feet to: NO RECOVERY. | 59.6' 60' NO RECOVERY SAND 60.7' 60.9' SILT SAND 61.7' 62' SILT SAND 63.8' 63.9' GRAVEL SAND 64.6' GRAVEL 65.1' SAND 66.2' NO RECOVERY | |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |
| 65 | | | | | | | | |
| 66 | | | | | | | | |
| 67 | | | | | | | | |
| 68 | | | | | | | | |
| 69 | | | | | | | | |
| 70 | | 8 | 120/83 | | | Brown, well sorted, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 76.9 feet to: NO RECOVERY. | 70' SAND | 3 |
| 71 | | | | | | | | |
| 72 | | | | | | | | |
| 73 | | | | | | | | |
| 74 | | | | | | | | |
| 75 | | | | | | | | |
| 76 | | | | | | | | |

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

3. Groundwater sample was collected from approximately 70.5 to 72.5 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28E

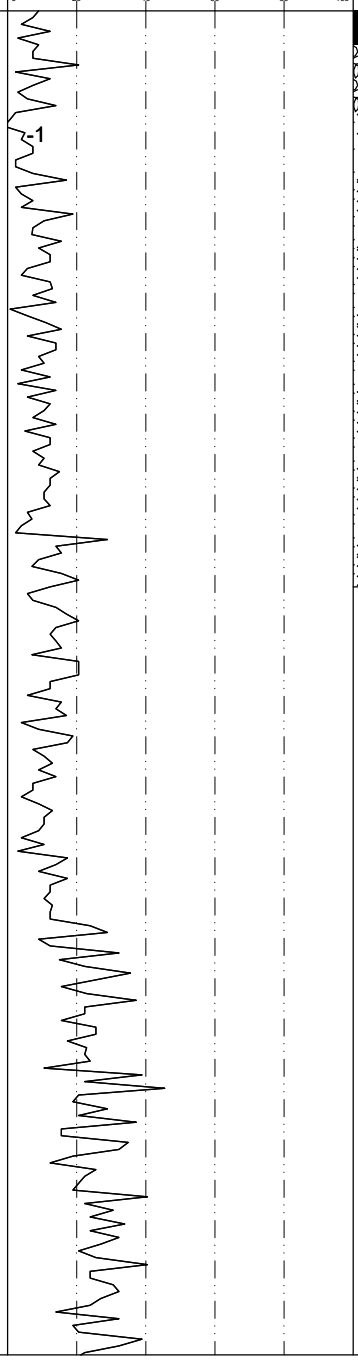
COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

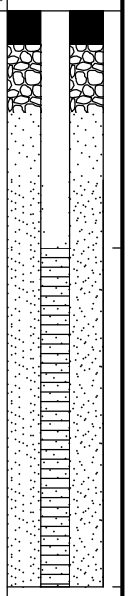
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28E
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 77 | | | | | | | 76.5 SAND | |
| | | | | | | | NO RECOVERY | |
| 78 | | | | | | | | |
| 79 | | | | | | | | |
| 80 | | 9 | 120/120 | | | Brown, well sorted, fine to medium SAND, trace Gravel, trace Silt, wet. Changing at 85.0 feet to: Dark grayish-brown, poorly sorted, Silty CLAY, trace Sand, trace Gravel, plastic, cohesive, moist. | 80' SAND | 4 |
| 81 | | | | | | | | |
| 82 | | | | | | | | |
| 83 | | | | | | | | |
| 84 | | | | | | | | |
| 85 | | | | | | | 85' Silty CLAY | |
| 86 | | | | | | | | |
| 87 | | | | | | | | |
| 88 | | | | | | | | |
| 89 | | | | | | | | |
| 90 | | 10 | 120/120 | | | Dark grayish-brown, poorly sorted, Silty CLAY, trace Sand, trace Gravel, plastic, cohesive, moist. | | |
| 91 | | | | | | | | |
| 92 | | | | | | | | |
| 93 | | | | | | | | |
| 94 | | | | | | | | |
| 95 | | | | | | | | |
| 96 | | | | | | | | |




**REMARKS**

4. Groundwater sample was collected from approximately 81.0 to 85.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

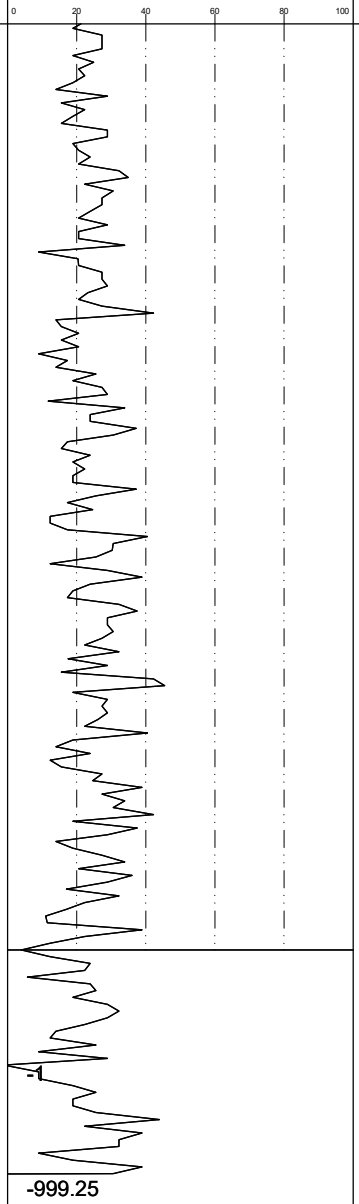
**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW28E
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 97–110 | | 11 | 120/120 | | | Dark grayish-brown, poorly sorted, Silty CLAY, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 102.7 feet to: Brownish-red, poorly consolidated, weathered SHALE, some gypsum, trace Gravel, moist. | Silty CLAY; 102.7' SHALE; 110' | |
| 110–116 | | | | | | Bottom of Borehole at 110.0 Feet | | 5 |

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

5. Monitoring well was installed in borehole upon completion. Well screen set from 80.6 to 85.2 feet below surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW28E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-29A
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Gary Geerligs
**Logged by:** Christopher Melby
**Date Start/Finish:** 10-4-19 / 10-4-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

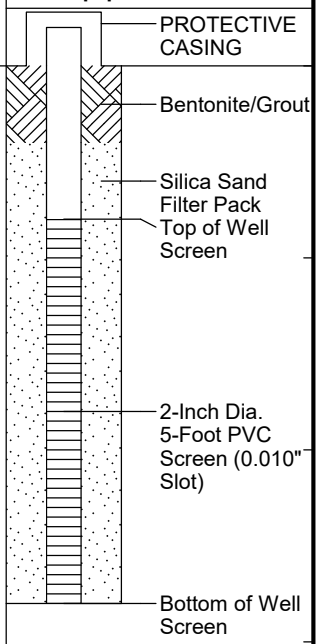
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–13 | | | | | | See HS-MW-29D for detailed soil descriptions. | | |
| 14 | | | | | | Bottom of Borehole at 14.0 Feet | | 1 |
| 15–29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well HS-MW-29A was installed in borehole upon completion. Well screen set from approximately 4.0 to 14.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-29B
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Gary Geerligs
**Logged by:** Christopher Melby
**Date Start/Finish:** 10-4-19 / 10-4-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

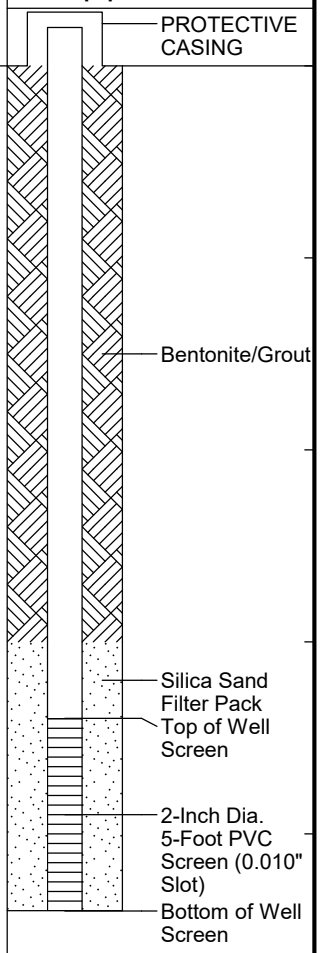
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–21 | | | | | | See HS-MW-29D for detailed soil descriptions. | | |
| 22–29 | | | | | | Bottom of Borehole at 22.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well HS-MW-29A was installed in borehole upon completion. Well screen set from approximately 17.0 to 22.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-29C
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Gary Geerligs
**Logged by:** Christopher Melby
**Date Start/Finish:** 10-2-19 / 10-3-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

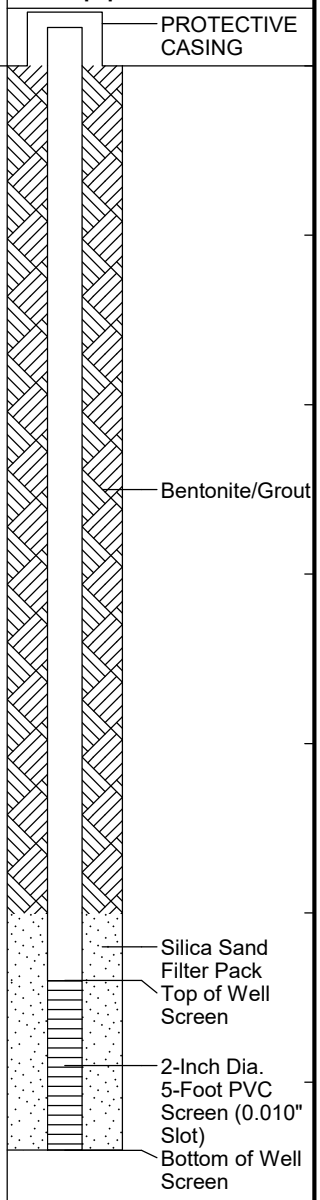
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–31 | | | | | | See HS-MW-29D for detailed soil descriptions. | | |
| 32–33 | | | | | | Bottom of Borehole at 32.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well HS-MW-29A was installed in borehole upon completion. Well screen set from approximately 27.0 to 32.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-29C

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-29D
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

**Contractor:** Stearns Drilling Company
**Foreman:** Gary Geerligs
**Logged by:** Christopher Melby
**Date Start/Finish:** 10-1-19 / 10-2-19
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 8.0" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | 140lbs | NA |
| **Hammer Fall:** | 30" | NA |
| **TOC Elev.:** | NA | NA |

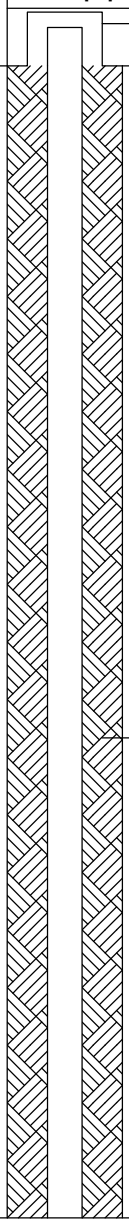
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 60/33 | 0-5 | | 0.0 ppm | Dark brown, fine to medium SAND, little Organic Matter (TOPSOIL). Changing at 1.2 feet to: Brown and gray, CLAY & SILT, little fine Sand, wet with Gravel in tip of sleeve at 2.7 feet. | SAND (TOPSOIL) 1.2' SAND | 1 |
| 5 | 2 | 60/48 | 5-10 | | 0.0 ppm | Brown and gray, fine to medium SAND, little Silt, wet. | | |
| 10 | 3 | 60/60 | 10-15 | | 0.0 ppm | Brown, fine to medium SAND, little Silt, wet. | | 2 |
| 15 | 4 | 60/57 | 15-20 | | 0.0 ppm | Brown, fine to medium SAND, little to trace Silt, wet (SM). | | |
| 20 | 5 | 60/60 | 20-25 | | 0.0 ppm | Brown, fine to medium SAND, trace Silt, wet. | | 3 |
| 25 | 6 | 60/60 | 25-30 | | 0.0 ppm | Brown, fine to medium SAND, trace Silt, wet. | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.
2. Soil sample was collected from approximately 11.0 to 15.0 feet below ground surface and submitted for analtyical laboratory testing.
3. Groundwater sample was collected from approximately 21.0 to 25.0 feet below ground surface and submitted for analytical laboratory analysis.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

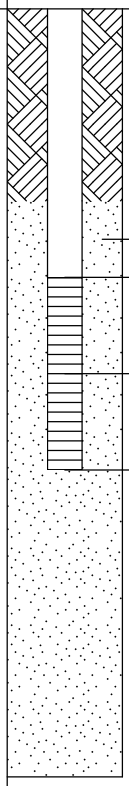
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide, Inc.
House Street
Belmont, Michigan

**Boring No.:** HS-MW-29D
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** JTM/JMG

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31 | 7 | 60/60 | 30-35 | | 0.0 ppm | Brown, fine to medium SAND, trace Silt, wet with small Gravel layer from 33.0 to 33.4 feet. | SAND | 4 |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | 8 | 60/60 | 35-40 | | 0.0 ppm | Brown, fine to medium SAND, trace Silt, wet. | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | 9 | 60/60 | 40-45 | | 0.0 ppm | Brown, fine to medium SAND, trace Silt, wet. | | 5 |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | 10 | 60/60 | 45-50 | | 0.0ppm | Brown, fine to medium SAND, trace Silt, wet. | | 6 |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | | | | | Bottom of Borehole at 50.0 Feet | 50' | 7 |
| 51 | | | | | | | | |
| 52 | | | | | | | | |
| 53 | | | | | | | | |
| 54 | | | | | | | | |
| 55 | | | | | | | | |
| 56 | | | | | | | | |
| 57 | | | | | | | | |
| 58 | | | | | | | | |
| 59 | | | | | | | | |
| 60 | | | | | | | | |
| 61 | | | | | | | | |
| 62 | | | | | | | | |
| 63 | | | | | | | | |
| 64 | | | | | | | | |

**Equipment Installed**




**REMARKS**

4. Groundwater sample was collected from approximately 31.0 to 35.0 feet below ground surface and submitted for analytical laboratory analysis.
5. Groundwater sample was collected from approximately 41.0 to 45.0 feet below ground surface and submitted for analytical laboratory analysis.
6. Soil sample was collected from approximately 46.0 to 50.0 feet below ground surface and submitted for analtyical laboratory testing.
7. Monitoring well was installed in borehole upon completion. Well screen set from 76.0 to 86.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_62355.52 HOUSE STREET COMPLETE.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30A
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-22-19 / 5-22-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-30E boring log for sample description and classification. | | | | PROTECTIVE CASING |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |

Gamma (API-GR): 0, 20, 40, 60, 80

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30A
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | | | | | | | |
| 34 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 37 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | | | | | | | | | | |
| 41 | | | | | | | | | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | Bottom of Borehole at 50.0 Feet | | 1 | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 45.1 to 49.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30A

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30B
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-30-19 / 5-30-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-30E boring log for sample description and classification. | | | | PROTECTIVE CASING |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |

Gamma (API-GR): 0, 20, 40, 60, 80

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30B

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30B
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | | | | | | | |
| 34 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 37 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | | | | | | | | | | |
| 41 | | | | | | | | | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | Bottom of Borehole at 55.0 Feet | | 1 | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 49.3 to 53.9 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30B

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30C
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-29-19 / 5-29-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW-30E boring log for sample description and classification. | | | | PROTECTIVE CASING |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | | | | | | | |
| 34 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 37 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30C

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30C
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | | | | | | | | | | |
| 66 | | | | | | | | | | |
| 67 | | | | | | | | | | |
| 68 | | | | | | | | | | |
| 69 | | | | | | | | | | |
| 70 | | | | | | | | | | |
| 71 | | | | | | | | | | |
| 72 | | | | | | | | | | |
| 73 | | | | | | | | | | |
| 74 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 76 | | | | | | | | | | |
| 77 | | | | | | | | | | |
| 78 | | | | | | | | | | |
| 79 | | | | | | | | | | |
| 80 | | | | | | Bottom of Borehole at 80.0 Feet | | 1 | | |
| 81 | | | | | | | | | | |
| 82 | | | | | | | | | | |
| 83 | | | | | | | | | | |
| 84 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 86 | | | | | | | | | | |
| 87 | | | | | | | | | | |
| 88 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 74.3 to 78.9 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30C

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30D
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-31-19 / 6-3-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1–56 | | | | | | See HS-MW-30E boring log for sample description and classification. | | | 0 20 40 60 80 | PROTECTIVE CASING |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30D
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 58–114 | | | | | | | | | | |
| 115 | | | | | | Bottom of Borehole at 115.0 Feet | | 1 | | |
| 116–123 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 109.5 to 114.1 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30E
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-13-19 / 5-28-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

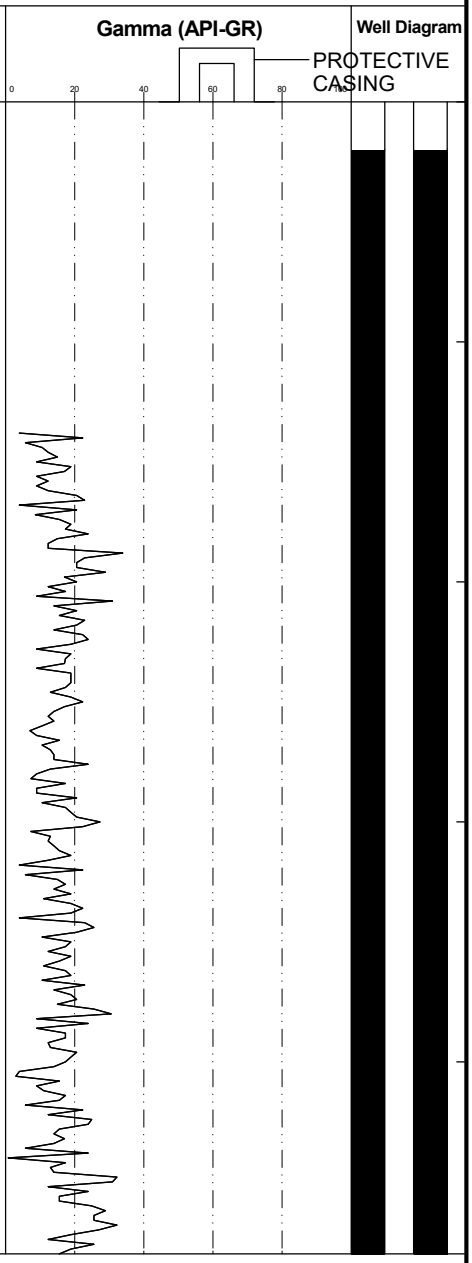
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–4 | | 1 | 120/56 | | 0.0 ppm | Very dark brown to dark brown, moderately well sorted, fine to medium SAND, some Silt, moist. Changing at 1.0 feet to: Dark yellowish-brown, moderately sorted, fine to medium SAND, little Silt, moist. Changing at 3.0 feet to: Yellowish-brown, poorly sorted, fine to coarse SAND, trace Gravel, trace Silt, moist. Changing at 4.7 feet to: NO RECOVERY. | SAND | 1 |
| 4.7' | | | | | | | NO RECOVERY | |
| 10' | | 2 | 120/48 | | 0.0 ppm | Brown to yellowish-brown, poorly sorted, coarse to medium SAND, some Gravel, trace Silt, moist. Changing at 10.8 feet to: Brown to yellowish-brown, poorly sorted, coarse to medium SAND, some Gravel, some Silt, non-plastic, cohesive, moist. Changing at 11.0 feet to: Brown to yellowish-brown, poorly sorted, coarse to medium SAND, some Gravel, trace Silt, moist. Changing at 11.4 feet to: Light yellowish-brown, moderately well sorted, fine to medium SAND, trace Silt, moist. Changing at 12.4 feet to: Yellowish-brown, poorly sorted, fine to coarse SAND, little Gravel, trace Silt, moist. Changing at 14.0 feet to: NO RECOVERY. | SAND | |
| 14' | | | | | | | NO RECOVERY | |
| 20' | | 3 | 120/65 | | 0.0 ppm | Yellowish-brown to dark yellowish-brown, poorly sorted, fine to coarse SAND, little Gravel, moist. Changing at 21.7 feet to: Yellowish-brown to brown, poorly sorted, fine to medium SAND, trace Gravel, trace Silt, moist. Changing at 22.8 feet to: Dark yellowish-brown to dark brown, poorly sorted, fine to coarse SAND, some gravel, | SAND | |




**REMARKS**

1. Field screening of samples for organic vapors was peformed with a MiniRae 3000 photoionization dector equipped with a 10.6 eV lamp. Readings above levels are shown in parts per million (ppm) isobutylene. Background was measured at 0.0 ppm.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30E

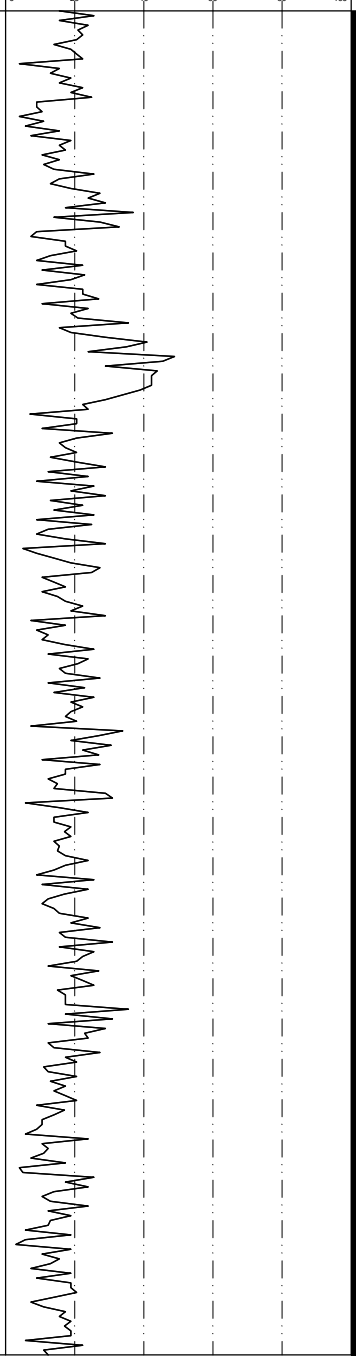
COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30E
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | trace Silt, moist. Changing at 25.4 feet to: NO RECOVERY. | SAND | |
| 25 | | | | | | | 25.4' | |
| 26 | | | | | | | NO RECOVERY | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | 4 | 120/58 | | 0.0 ppm | Yellowish-brown to dark yellowish-brown, poorly sorted, fine to coarse SAND, little Gravel, trace Silt, moist. Changing at 31.3 feet to: Light yellowish-brown, moderately well sorted, fine to medium SAND, trace Silt, moist. Changing at 34.8 feet to: NO RECOVERY. | 30' SAND | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | 34.8' NO RECOVERY | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | 5 | 120/0 | | | NO RECOVERY. | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |
| 50 | | 6 | 120/19 | | 0.0 ppm | Yellowish-brown, poorly sorted, medium to coarse SAND, some Gravel, trace Silt, wet. Changing at 50.9 feet to: Dark yellowish-brown, poorly sorted, medium to | 50' SAND | |
| 51 | | | | | | | 51.6' | |




Well Diagram

**REMARKS**

2. Groundwater sample collected from 52.0 to 54.0 feet and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

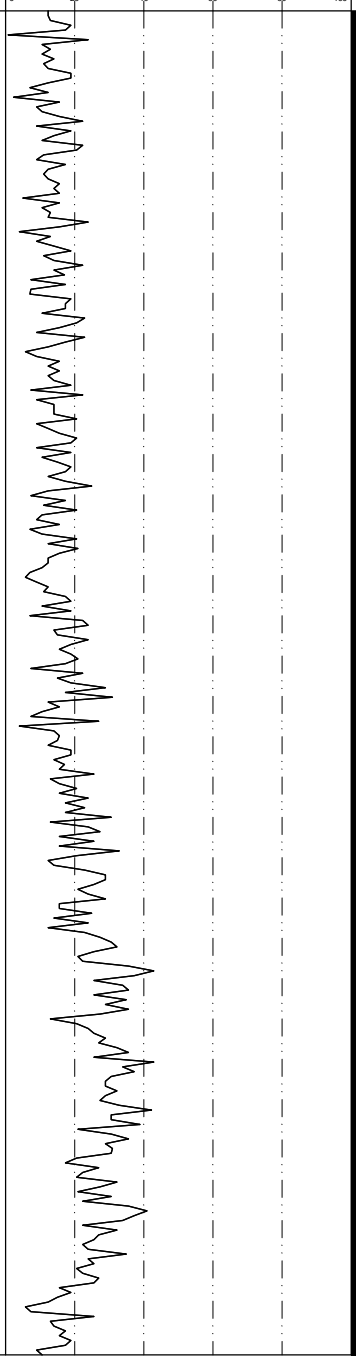
Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30E
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | coarse SAND, some Gravel, trace Silt, wet. Changing at 51.6 feet to: NO RECOVERY. | NO RECOVERY | 2 |
| 60 | | 7 | 120/97 | | 0.0 ppm | Yellowish-brown, poorly sorted, GRAVEL, some fine to coarse grained Sand, trace Silt, wet. Changing at 60.5 feet to: Yellowish-brown, moderately well sorted, fine to medium SAND, trace Silt, wet. Changing at 62.5 feet to: Grayish-brown to dark brown, poorly sorted, Silty CLAY, little Sand, plastic, cohesive, moist. Changing at 63.5 feet to: Grayish-brown to dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 68.1 feet to: NO RECOVERY. | 60' GRAVEL 60.5' SAND 62.5' CLAY 68.1' NO RECOVERY | 3 |
| 70 | | 8 | 120/119 | | 0.0 ppm | Grayish-brown to dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 72.6 feet to: Dark yellowish-brown to dark red, poorly sorted, coarse SAND, little Gravel, trace Silt, wet. Changing at 77.9 feet to: Brown to yellowish-brown, well sorted, fine SAND, little Silt, wet. Changing at 79.9 feet to: NO RECOVERY. | 70' Silty CLAY 72.6' SAND 79.9' | 4 |

Depth: 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

3. Groundwater sample collected from 61.0 to 63.0 feet and submitted for analytical laboratory testing.
4. Groundwater sample collected from 75.0 to 77.0 feet and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

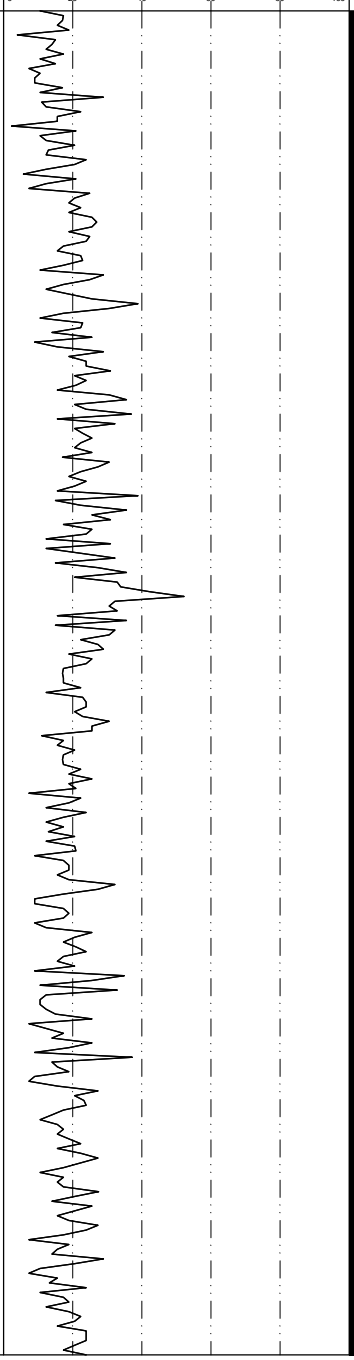
Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30E
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | 9 | 120/114 | | 0.0 ppm | Brown to yellowish-brown, well sorted, fine SAND, little Silt, wet. Changing at 83.7 feet to: Dark red, very well sorted, fine SAND, trace Silt, wet. Changing at 83.8 feet to: Dark grayish-brown to dark brown, poorly sorted, Silty CLAY, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 84.2 feet to: Dark grayish-brown to dark brown, very well sorted, SILT, wet. Changing at 85.2 feet to: Dark grayish-brown to dark brown, poorly sorted, Silty CLAY, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 86.9 feet to: Yellowish-brown, moderately sorted, SILT, wet, with thin dark brown, Silty Clay stringers, moist. Changing at 87.2 feet to: Brown, very well sorted, SILT, some fine grained Sand, wet. Changing at 89.5 feet to: NO RECOVERY. | 80' NO RECOVERY SAND; 83.8'; 84.2 Silty CLAY SILT; 85.2 Silty CLAY; 86.9' SILT; 89.5' | |
| | | 10 | 120/108 | | 0.0 ppm | Yellowish-brown, very well sorted, fine SAND, little Silt, wet. Changing at 99.0 feet to: NO RECOVERY. | 90' NO RECOVERY SAND; 99' | |
| | | 11 | 120/96 | | 0.0 ppm | Yellowish-brown, very well sorted, fine SAND, little Silt, wet. Changing at 108.0 feet to: NO RECOVERY. | NO RECOVERY 100' SAND; 108' | 5 |

Depth: 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

5. Groundwater sample collected from 100.0 to 102.0 feet and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30E

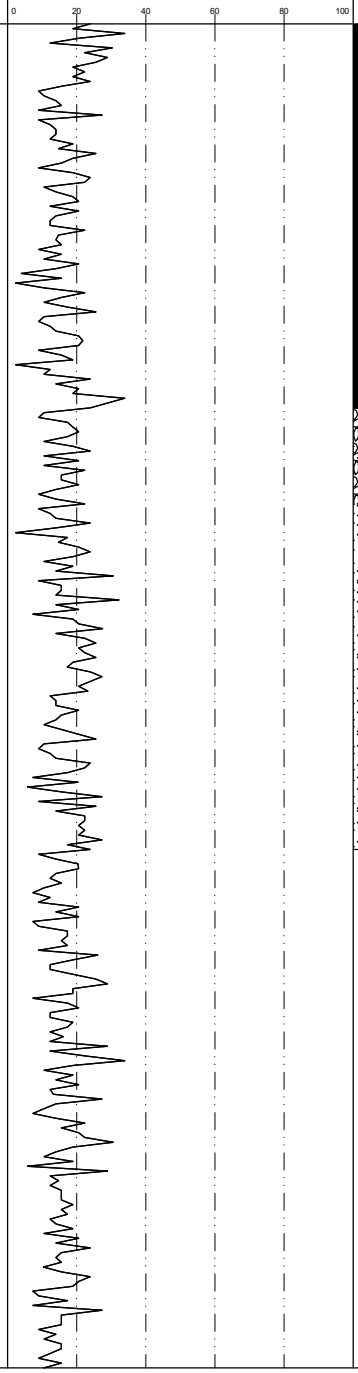
COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

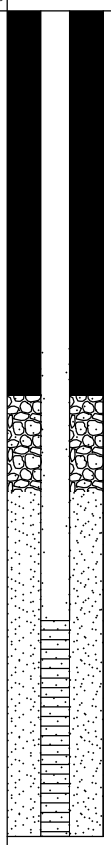
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30E
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 109–115 | | 12 | 120/95 | | 0.0 ppm | Yellowish-brown, very well sorted, fine SAND, little Silt, wet. Changing at 111.3 feet to: Yellowish-brown, very well sorted SILT, little fine grained Sand, slightly cohesive, wet. Changing at 111.8 feet to: Yellowish-brown, very well sorted, fine SAND, little Silt, wet. Changing at 117.9 feet to: NO RECOVERY. | NO RECOVERY; 110' SAND; 111.3' SILT; 111.8' SAND | 6 |
| 116–125 | | 13 | 120/76 | | 0.0 ppm | Yellowish-brown, very well sorted, fine SAND, little Silt, grading slightly coarser (fine to medium grained SAND, trace Gravel, little Silt), wet. Changing at 126.3 feet to: NO RECOVERY. | | 7 |
| 126–129 | | | | | | | 126.3' NO RECOVERY | 8 |
| 130–135 | | 14 | 120/77 | | 0.0 ppm | Yellowish-brown, moderately sorted, fine to medium SAND, little Silt, trace Gravel, wet. Changing at 131.0 feet to: Dark yellowish-brown, moderately sorted, fine to medium SAND, little Silt, trace Gravel, wet. Changing at 131.6 feet to: Yellowish-brown, moderately sorted, fine to medium SAND, little Silt, wet. Changing at 136.4 feet to: NO RECOVERY. | 130' SAND | |




**REMARKS**

6. Groundwater sample collected from 111.0 to 113.0 feet and submitted for analytical laboratory testing.
7. Groundwater sample collected from 121.0 to 123.0 feet and submitted for analytical laboratory testing.
8. Groundwater sample collected from 128.0 to 130.0 feet and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30E

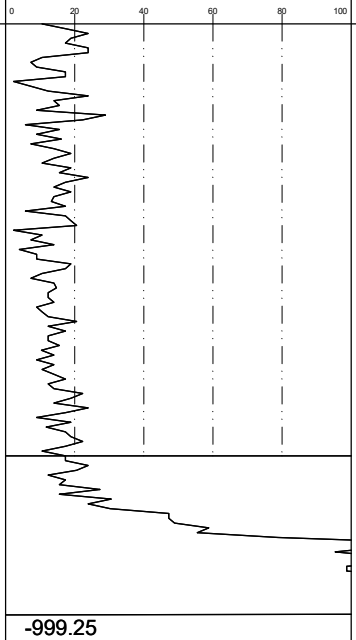
COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW30E
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 137 | | | | | | | 136.4' NO RECOVERY | | | |
| 138 | | | | | | | | 9 | | |
| 139 | | | | | | | | | | |
| 140 | | 15 | 60/34 | | 0.0 ppm | Dark gray, with some dark red iron staining, SHALE. Changing at 142.8 feet to: NO RECOVERY | 140' SHALE | | | |
| 141 | | | | | | | | | | |
| 142 | | | | | | | | | | |
| 143 | | | | | | | 142.8' NO RECOVERY. | | | |
| 144 | | | | | | | | | | |
| 145 | | | | | | Bottom of Borehole at 145.0 Feet | 145' | 10 | -999.25 | |
| 146 | | | | | | | | | | |
| 147 | | | | | | | | | | |
| 148 | | | | | | | | | | |
| 149 | | | | | | | | | | |
| 150 | | | | | | | | | | |
| 151 | | | | | | | | | | |
| 152 | | | | | | | | | | |
| 153 | | | | | | | | | | |
| 154 | | | | | | | | | | |
| 155 | | | | | | | | | | |
| 156 | | | | | | | | | | |
| 157 | | | | | | | | | | |
| 158 | | | | | | | | | | |
| 159 | | | | | | | | | | |
| 160 | | | | | | | | | | |
| 161 | | | | | | | | | | |
| 162 | | | | | | | | | | |
| 163 | | | | | | | | | | |




**REMARKS**

9. Groundwater sample collected from 138.0 to 140.0 feet and submitted for analytical laboratory testing.
10. Monitoring well HS-MW30E was installed in borehole upon completion. Well screen set from 120.7 to 125.2 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW30E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW31A
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-4-19 / 6-4-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–20 | | | | | | See HS-MW-31E boring log for sample description and classification. | | |
| 21 | | | | | | Bottom of Borehole at 21.0 Feet | | 1 |
| 22–23 | | | | | | | | |

Gamma (API-GR) 0 20 40 60 80

Well Diagram: PROTECTIVE CASING

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 16.1 to 20.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW31A

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-31B
**Page:** 1 **of** 1
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-20-19 / 5-20-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | 254125 | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–30 | | | | | | See HS-MW31E boring log for sample description and classification. | | |
| 30–32 | | | | | | Bottom of Borehole at 30.0 Feet | | 1 |

Gamma (API-GR) 0 20 40 60 80 100

Well Diagram: PROTECTIVE CASING

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 24.2 to 28.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-31B

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-31C
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-4-19 / 6-4-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See HS-MW31E boring log for sample description and classification. | | | | PROTECTIVE CASING |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-31C

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-31C
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | | | | | | | |
| 34 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 37 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | | | | | | | | | | |
| 41 | | | | | | | | | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | | | | | | Bottom of Borehole at 45.0 Feet | | 1 | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 39.4 to 43.9 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-31C

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-31D
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 6-3-19 / 6-4-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | See HS-MW31E boring log for sample description and classification. | | | | PROTECTIVE CASING |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-31D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-31D
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 41 | | | | | | | | | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | | | | | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | | | | | | | | | | |
| 66 | | | | | | | | | | |
| 67 | | | | | | | | | | |
| 68 | | | | | | Bottom of Borehole at 68.0 Feet | | 1 | | |
| 69 | | | | | | | | | | |
| 70 | | | | | | | | | | |
| 71 | | | | | | | | | | |
| 72 | | | | | | | | | | |
| 73 | | | | | | | | | | |
| 74 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 76 | | | | | | | | | | |
| 77 | | | | | | | | | | |
| 78 | | | | | | | | | | |
| 79 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 81 | | | | | | | | | | |
| 82 | | | | | | | | | | |
| 83 | | | | | | | | | | |
| 84 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 86 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 61.8 to 66.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-31D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-31E
**Page:** 1 **of** 3
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-16-19 / 5-21-19
**Boring Location:** 6205 Packer Drive, NE, Belmont, MI
**GS Elev.:** **Datum:**

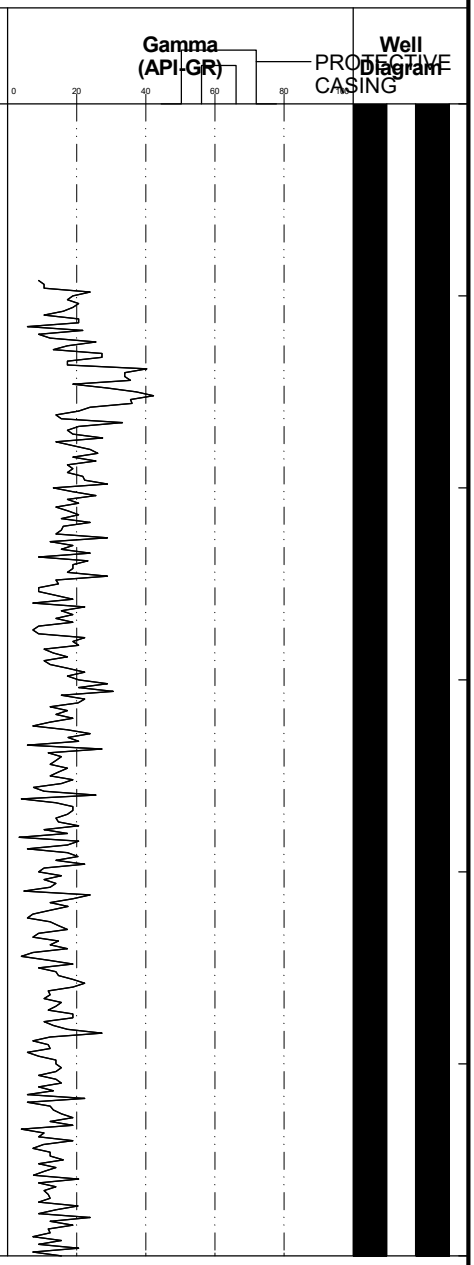
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–7 | | 1 | 120/71 | | 0.0 ppm | Very dark brown, moderately well sorted, SILT, some fine grained Sand, moist. Changing at 2.5 feet to: Dark reddish-brown, poorly sorted, fine to medium SAND, little Silt, moist. Changing at 3.2 feet to: Dark yellowish-brown, poorly sorted, fine to coarse SAND, little Gravel, trace Silt, moist. Changing at 5.3 feet to: Yellowish-brown, poorly sorted, fine to coarse SAND, trace Silt, moist. Changing at 5.9 feet to: NO RECOVERY. | SILT; 2.5' SAND; 5.9' NO RECOVERY | |
| 10–17 | | 2 | 120/78 | | 0.0 pm | Yellowish-brown, poorly sorted, fine to coarse SAND, trace Silt, moist. Changing at 13.2 feet to: Dark yellowish-brown, well sorted, fine to medium SAND, trace Silt, moist to wet. Changing at 16.5 feet to: NO RECOVERY. | 10' SAND; 16.5' NO RECOVERY | |
| 20–26 | | 3 | 120/67 | | 0.0 ppm | Yellowish-brown, well sorted, well sorted, fine to medium SAND, trace Silt, moist to wet. Changing at 25.6 feet to: NO RECOVERY. | 20' SAND; 25.6' NO RECOVERY; 30' | 1 |




**REMARKS**

1. Groundwater sample collected from 21.0 to 22.5 feet and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-31E

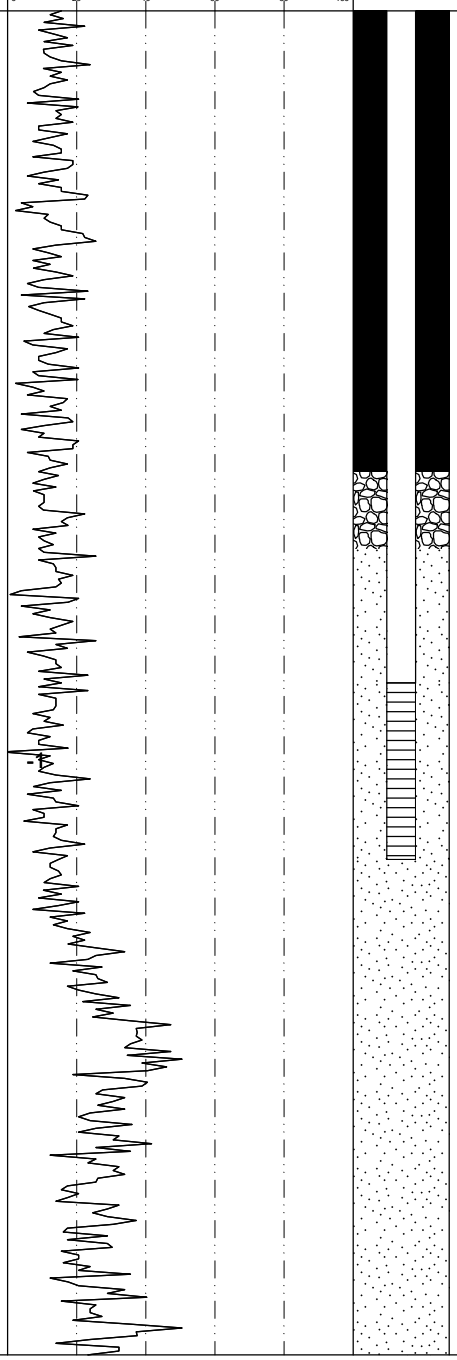
COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-31E
**Page:** 2 **of** 3
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31–36 | | 4 | 120/76 | | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium SAND, trace Silt, moist to wet. Changing at 36.3 feet to: NO RECOVERY. | SAND | 2 |
| 36–40 | | | | | | | 36.3' NO RECOVERY | |
| 40–47 | | 5 | 120/85 | | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium SAND, trace Silt, moist to wet. Changing at 47.1 feet to: NO RECOVERY. | 40' SAND | 3 |
| 47–50 | | | | | | | 47.1' NO RECOVERY | |
| 50–57 | | 6 | 120/108 | | 0.0 ppm | Dark yellowish-brown, well sorted, fine to medium SAND, trace Silt, moist to wet. Changing at 53.3 feet to: Very dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 57.4 feet to: Dark grayish-brown to dark brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 57.9 feet to: Very dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 59.0 feet to: NO RECOVERY. | 50' SAND; 53' Silty CLAY | 4 |
| 57–59 | | | | | | | 57.4' SAND; 57.9' Silty CLAY; 59' NO RECOVERY | |
| 59–62 | | 7 | 120/120 | | 0.0 ppm | Very dark, grayish brown to dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 62.7 feet to: Grayish-brown to brown, moderately well sorted, fine to medium SAND, trace Silt, moist to wet. Changing at 63.4 feet to: Dark brown, poorly sorted, fine to coarse SAND, | 60' Silty CLAY; 62.7' SAND | |




**REMARKS**

2. Groundwater sample collected from 31.0 to 32.5 feet and submitted for analytical laboratory testing.
3. Groundwater sample collected from 41.0 to 42.5 feet and submitted for analytical laboratory testing.
4. Groundwater sample collected from 51.0 to 52.5 feet and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-31E

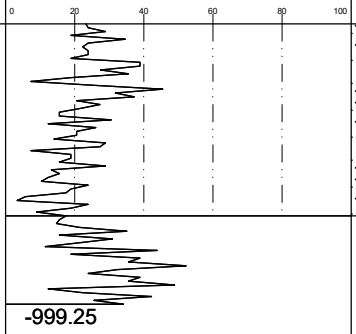
COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-31E
**Page:** 3 **of** 3
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 66 | | | | | | some Gravel, little Silt, trace Clay, non-plastic, moderately cohesive, moist to wet. Changing at 66.5 feet to: Hard, dark brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 68.3 feet to: Very hard, brown, poorly sorted, Silty CLAY, trace Gravel, possible red Bedrock, dry to moist. | SAND | | | |
| 67 | | | | | | | 66.5' Silty CLAY | | | |
| 68 | | | | | | | 68.3' | | | |
| 69 | | | | | | | | | | |
| 70 | | | | | | Bottom of Borehole at 70.0 Feet | | 5 | -999.25 | |
| 71 | | | | | | | | | | |
| 72 | | | | | | | | | | |
| 73 | | | | | | | | | | |
| 74 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 76 | | | | | | | | | | |
| 77 | | | | | | | | | | |
| 78 | | | | | | | | | | |
| 79 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 81 | | | | | | | | | | |
| 82 | | | | | | | | | | |
| 83 | | | | | | | | | | |
| 84 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 86 | | | | | | | | | | |
| 87 | | | | | | | | | | |
| 88 | | | | | | | | | | |
| 89 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 91 | | | | | | | | | | |
| 92 | | | | | | | | | | |
| 93 | | | | | | | | | | |
| 94 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 96 | | | | | | | | | | |
| 97 | | | | | | | | | | |
| 98 | | | | | | | | | | |
| 99 | | | | | | | | | | |




**REMARKS**

5. Monitoring well HS-MW31B was installed in borehole upon completion. Well screen set from 24.2 to 28.8 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-31E

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32A
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-9-19 / 5-9-19
**Boring Location:** 1332 10 Mile Road NE, Comstock Park, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1–44 | | | | | | See HS-MW-32D boring log for sample description and classification. | | | | PROTECTIVE CASING |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32A

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32A
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 46 | | | | | | | | | | |
| 47 | | | | | | | | | | |
| 48 | | | | | | | | | | |
| 49 | | | | | | | | | | |
| 50 | | | | | | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | | | | | | | |
| 53 | | | | | | | | | | |
| 54 | | | | | | | | | | |
| 55 | | | | | | | | | | |
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | | | | | | Bottom of Borehole at 65.0 Feet | | 1 | | |
| 66 | | | | | | | | | | |
| 67 | | | | | | | | | | |
| 68 | | | | | | | | | | |
| 69 | | | | | | | | | | |
| 70 | | | | | | | | | | |
| 71 | | | | | | | | | | |
| 72 | | | | | | | | | | |
| 73 | | | | | | | | | | |
| 74 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 76 | | | | | | | | | | |
| 77 | | | | | | | | | | |
| 78 | | | | | | | | | | |
| 79 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 81 | | | | | | | | | | |
| 82 | | | | | | | | | | |
| 83 | | | | | | | | | | |
| 84 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 86 | | | | | | | | | | |
| 87 | | | | | | | | | | |
| 88 | | | | | | | | | | |
| 89 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 91 | | | | | | | | | | |
| 92 | | | | | | | | | | |
| 93 | | | | | | | | | | |
| 94 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 96 | | | | | | | | | | |
| 97 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 57.8 to 62.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32A

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32B
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-8-19 / 5-8-19
**Boring Location:** 1332 10 Mile Road NE, Comstock Park, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | See HS-MW-32D boring log for sample description and classification. | | | | PROTECTIVE CASING |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32B

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32B
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 51–82 | | | | | | | | | | |
| 83 | | | | | | Bottom of Borehole at 83.0 Feet | | 1 | | |
| 84–108 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 78.2 to 82.8 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32B

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32C
**Page:** 1 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** JTM
**Date Start/Finish:** 5-8-19 / 5-8-19
**Boring Location:** 1332 10 Mile Road NE, Comstock Park, MI
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 1–54 | | | | | | See HS-MW-32D boring log for sample description and classification. | | | | PROTECTIVE CASING |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32C

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32C
**Page:** 2 **of** 2
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Gamma (API-GR) 0 20 40 60 80 100 | Well Diagram |
|---|---|---|---|---|---|---|---|---|---|---|
| 56 | | | | | | | | | | |
| 57 | | | | | | | | | | |
| 58 | | | | | | | | | | |
| 59 | | | | | | | | | | |
| 60 | | | | | | | | | | |
| 61 | | | | | | | | | | |
| 62 | | | | | | | | | | |
| 63 | | | | | | | | | | |
| 64 | | | | | | | | | | |
| 65 | | | | | | | | | | |
| 66 | | | | | | | | | | |
| 67 | | | | | | | | | | |
| 68 | | | | | | | | | | |
| 69 | | | | | | | | | | |
| 70 | | | | | | | | | | |
| 71 | | | | | | | | | | |
| 72 | | | | | | | | | | |
| 73 | | | | | | | | | | |
| 74 | | | | | | | | | | |
| 75 | | | | | | | | | | |
| 76 | | | | | | | | | | |
| 77 | | | | | | | | | | |
| 78 | | | | | | | | | | |
| 79 | | | | | | | | | | |
| 80 | | | | | | | | | | |
| 81 | | | | | | | | | | |
| 82 | | | | | | | | | | |
| 83 | | | | | | | | | | |
| 84 | | | | | | | | | | |
| 85 | | | | | | | | | | |
| 86 | | | | | | | | | | |
| 87 | | | | | | | | | | |
| 88 | | | | | | | | | | |
| 89 | | | | | | | | | | |
| 90 | | | | | | | | | | |
| 91 | | | | | | | | | | |
| 92 | | | | | | | | | | |
| 93 | | | | | | | | | | |
| 94 | | | | | | | | | | |
| 95 | | | | | | | | | | |
| 96 | | | | | | | | | | |
| 97 | | | | | | | | | | |
| 98 | | | | | | | | | | |
| 99 | | | | | | | | | | |
| 100 | | | | | | | | | | |
| 101 | | | | | | | | | | |
| 102 | | | | | | | | | | |
| 103 | | | | | | | | | | |
| 104 | | | | | | | | | | |
| 105 | | | | | | | | | | |
| 106 | | | | | | | | | | |
| 107 | | | | | | | | | | |
| 108 | | | | | | | | | | |
| 109 | | | | | | | | | | |
| 110 | | | | | | | | | | |
| 111 | | | | | | | | | | |
| 112 | | | | | | Bottom of Borehole at 112.0 Feet | | 1 | | |
| 113 | | | | | | | | | | |
| 114 | | | | | | | | | | |
| 115 | | | | | | | | | | |
| 116 | | | | | | | | | | |
| 117 | | | | | | | | | | |
| 118 | | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 107.2 to 111.8 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32C

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/15/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32D
**Page:** 1 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

**Contractor:** Stock
**Foreman:** Ryan
**Logged by:** MJS/KWO
**Date Start/Finish:** 5-6-19 / 5-6-19
**Boring Location:** 1332 10 Mile Road NE, Comstock Park, MI
**GS Elev.:** **Datum:**

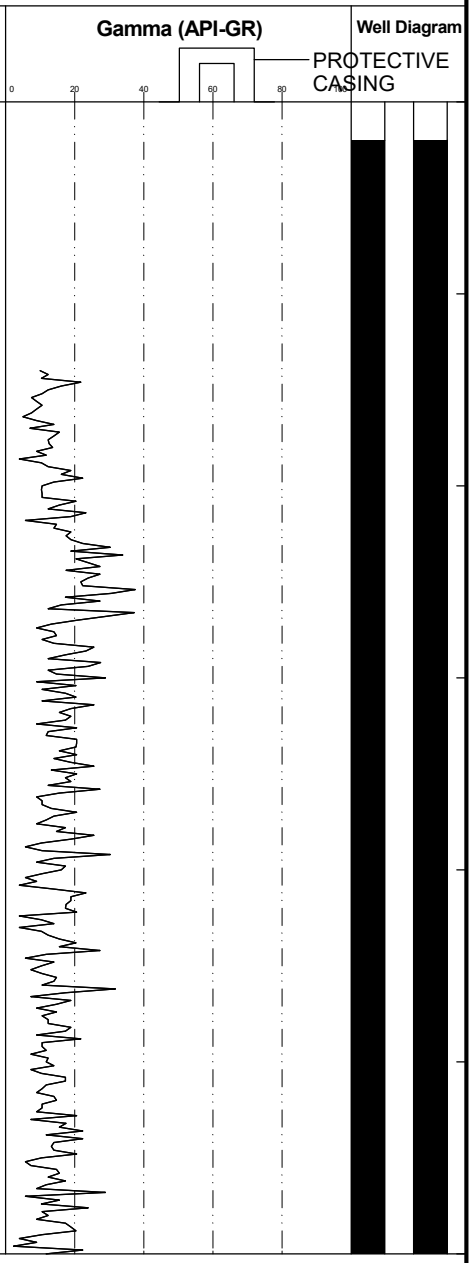
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Sonic | NA |
| **O.D. / I.D.:** | NA | NA |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **TOC Elev.:** | | |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| 3-2-99 | 17:00 | 7.2 | 5 | 5 min. |
| 3-3-99 | 08:00 | 6.5 | 5 | 15 hours |
| 3-3-99 | 12:00 | 6.8 | --- | 20 min. |

**Surveyed By:** **Survey Date:**

| Depth | Elevation (ft.) | Sample No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | 1 | 24/24 | | | Black, TOPSOIL with Roots and Grass. Changing at 0.5 feet to: Loose, brown, fine to medium SAND, trace fine Gravel, moist. | 0.5 TOPSOIL; SAND | |
| 2 | | 2 | 96/48 | | 0.0 ppm | Loose, brown, fine to medium SAND, trace Silt, moist. Changing at 3.5 feet to: Loose, brown, fine to medium SAND and GRAVEL, moist. | | 1 |
| 3 | | | | | | | | |
| 4 | | | | | 0.0 ppm | | 3.5' SAND and GRAVEL | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | 3 | 120/72 | | 1.0 ppm | Loose, brown, fine to coarse SAND, trace Gravel, trace Silt, moist. | 10' SAND | |
| 11 | | | | | | | | |
| 12 | | | | | 1.3 ppm | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | 4 | 120/90 | | 1.7 ppm | Loose, brown, fine to coarse SAND and GRAVEL, trace Clay & Silt, moist. | 20' SAND and GRAVEL | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | 1.6 ppm | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |




**REMARKS**

1. Field screening of samples for organic vapors was peformed with a MiniRae 3000 photoionization dector equipped with a 10.6 eV lamp. Readings above levels are shown in parts per million (ppm) isobutylene. Background was measured at 0.0 ppm.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

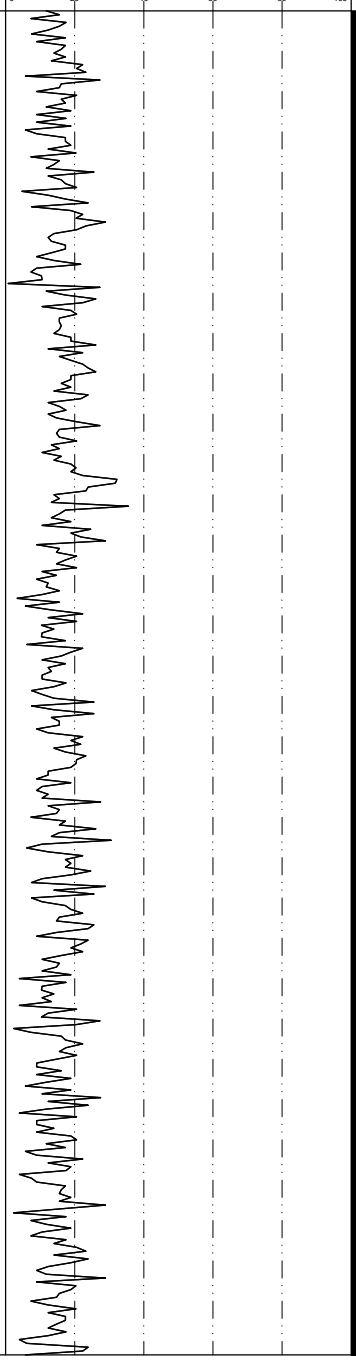
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32D
**Page:** 2 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 31–38 | | 5 | 120/120 | | 0.4 ppm<br>0.5 ppm | Loose, gray, fine to coarse SAND and GRAVEL, moist. Changing at 38.0 feet to: Soft, gray, Silty SAND, moist. Changing at 35.0 feet to: Loose, gray, fine to medium SAND, moist to wet. | SAND and GRAVEL<br>38'<br>SAND | |
| 40–41 | | 6 | 120/120 | | 1.5 ppm<br>1.8 ppm | Loose, gray, Silty SAND, moist. | | |
| 50–55 | | 7 | 120/120 | | 0.4 ppm<br>0.3 ppm | Loose, gray, Silty SAND, moist. | | 2 |
| 60–64 | | 8 | 120/120 | | 1.4 ppm | Loose, brown, fine to coarse SAND and Gravel, wet. Changing at 65.0 feet to: Loose, gray, fine to medium SAND, wet. | | |

Gamma (API-GR)




Well Diagram

**REMARKS**

2. Temporary well pushed to 64.0 feet below ground surface. Groundwater collected for laboratory analytical testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

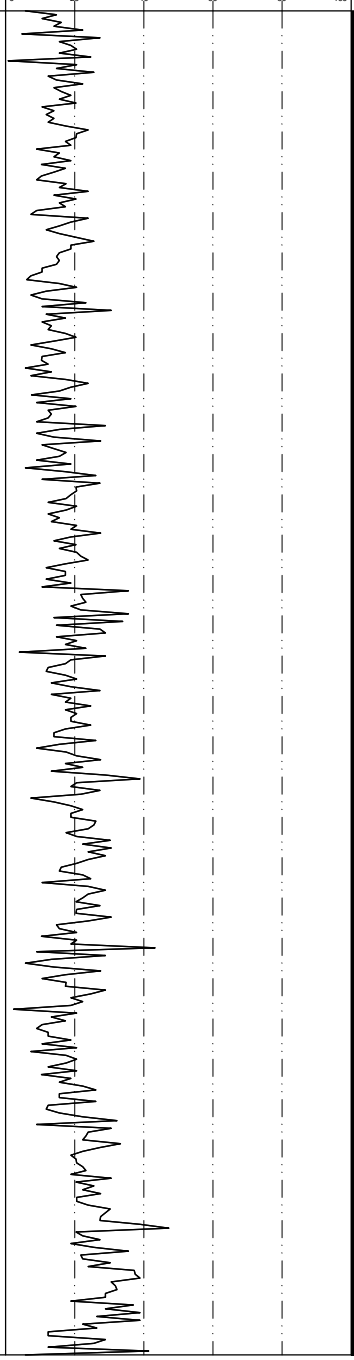
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32D
**Page:** 3 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2.2 ppm | | SAND | |
| 66 | | | | | | | | |
| 67 | | | | | | | | |
| 68 | | | | | | | | |
| 69 | | | | | | | | |
| 70 | | 9 | 120/120 | | 1.5 ppm | Gray, medium stiff, SILT, trace Gravel, trace Sand, wet. Changing at 72.5 feet to: Stiff, gray, Silty SAND, moist. | 70' SILT | |
| 71 | | | | | | | | |
| 72 | | | | | | | 72.5' SAND | |
| 73 | | | | | | | | |
| 74 | | | | | | | | 3 |
| 75 | | | | | 2.0 ppm | | | |
| 76 | | | | | | | | |
| 77 | | | | | | | | |
| 78 | | | | | | | | |
| 79 | | | | | | | | |
| 80 | | 10 | 120/120 | | 1.0 ppm | Loose, gray, fine to medium SAND, wet. Changing at 83.3 feet to: Stiff, gray, SILT, trace fine Sand, moist. | | |
| 81 | | | | | | | | |
| 82 | | | | | | | | |
| 83 | | | | | | | 83.3' SILT | |
| 84 | | | | | | | | |
| 85 | | | | | 4.5 ppm | | | |
| 86 | | | | | | | | |
| 87 | | | | | | | | |
| 88 | | | | | | | | |
| 89 | | | | | | | | |
| 90 | | 11 | 120/120 | | 2.5 ppm | Stiff, gray, SILT, trace fine to coarse Sand, moist. | | |
| 91 | | | | | | | | |
| 92 | | | | | | | | |
| 93 | | | | | | | | |
| 94 | | | | | | | | |
| 95 | | | | | 3.0 ppm | | | |
| 96 | | | | | | | | |
| 97 | | | | | | | | |
| 98 | | | | | | | | |
| 99 | | | | | | | | |

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

3. Temporary well pushed to 74.0 feet below ground surface. Groundwater collected for laboratory analytical testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

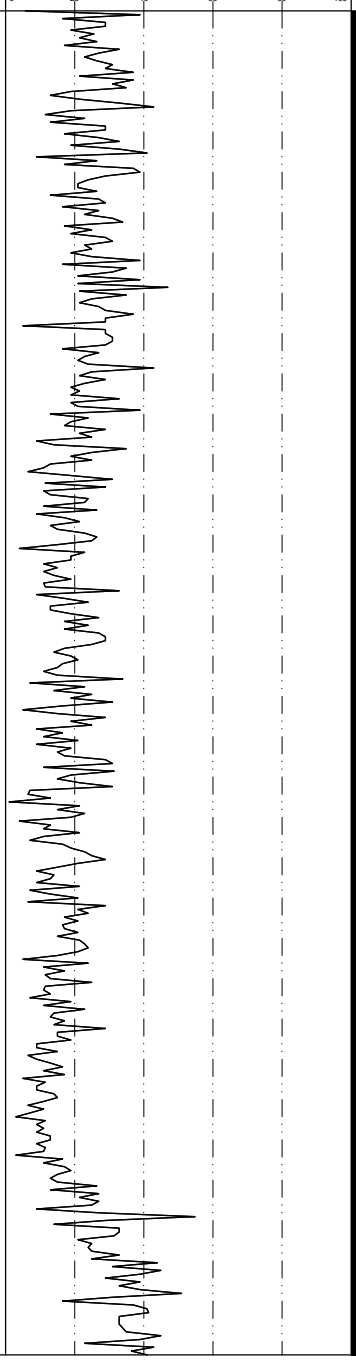
**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32D
**Page:** 4 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft.) | Sample Information: No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | 12 | 120/120 | | 0.6 ppm | Stiff, gray, SILT, trace fine Sand, moist. Changing at 107.0 feet to: Loose, fine to coarse SAND, trace Silt, moist. | SILT | |
| 101 | | | | | | | | |
| 102 | | | | | | | | |
| 103 | | | | | | | | |
| 104 | | | | | | | | |
| 105 | | | | | 1.2 ppm | | | |
| 106 | | | | | | | | |
| 107 | | | | | | | 107' SAND | |
| 108 | | | | | | | | |
| 109 | | | | | | | | |
| 110 | | 13 | 60/60 | | 5.1 ppm | Loose, gray, fine to coarse SAND, wet. | | |
| 111 | | | | | | | | |
| 112 | | | | | | | | 4 |
| 113 | | | | | | | | |
| 114 | | | | | | | | |
| 115 | | 14 | 60/60 | | 7.1 ppm | Loose, gray, fine to coarse SAND, trace Silt, moist. | | |
| 116 | | | | | | | | |
| 117 | | | | | | | | |
| 118 | | | | | | | | |
| 119 | | | | | | | | |
| 120 | | 15 | 120/120 | | 0.5 ppm | Loose, gray, fine to coarse SAND, moist. | | |
| 121 | | | | | | | | |
| 122 | | | | | | | | 5 |
| 123 | | | | | | | | |
| 124 | | | | | | | | |
| 125 | | | | | 0.4 ppm | | | |
| 126 | | | | | | | | |
| 127 | | | | | | | | |
| 128 | | | | | | | | |
| 129 | | | | | | | | |
| 130 | | 16 | 120/120 | | 1.0 ppm | Loose, gray, Silty SAND, some fine Gravel, moist. | | |
| 131 | | | | | | | | |
| 132 | | | | | | | | |
| 133 | | | | | | | | |
| 134 | | | | | | | | |

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

4. Temporary well pushed to 112.0 feet below ground surface. Groundwater collected for laboratory analytical testing.
5. Temporary well pushed to 122.0 feet below ground surface. Groundwater collected for laboratory analytical testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

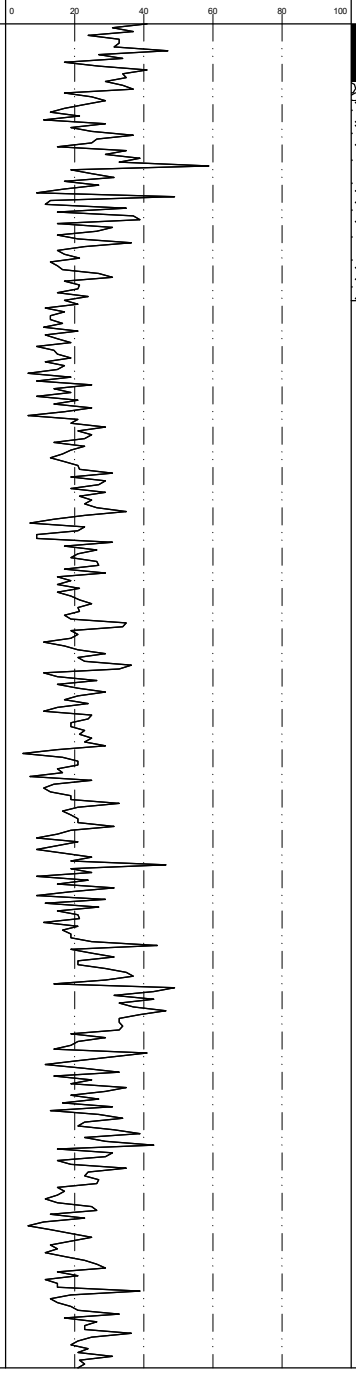
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

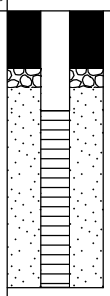
**Boring No.:** HS-MW-32D
**Page:** 5 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 136 | | | | | 0. ppm | | SAND | |
| 137 | | | | | | | | |
| 138 | | | | | | | | |
| 139 | | | | | | | | |
| 140 | | 17 | 120/120 | | 0.9 ppm | Loose, gray, fine to coarse SAND, black and gray, some Silt, moist. Changing at 145.0 feet to: Dense, gray and black, SAND and SILT, trace coarse Gravel, , moist. | | 6 |
| 141 | | | | | | | | |
| 142 | | | | | | | | |
| 143 | | | | | | | | |
| 144 | | | | | | | | |
| 145 | | | | | 0.5 ppm | | | |
| 146 | | | | | | | | |
| 147 | | | | | | | | |
| 148 | | | | | | | | |
| 149 | | | | | | | | |
| 150 | | 18 | 120/120 | | 1.7 ppm | Dense, gray, CLAY, some fine to coarse SAND, moist. Changing at 151.7 feet to: Loose, gray, fine to coarse SAND, some Silt, wet. | 150' CLAY | |
| 151 | | | | | | | 151.7' SAND | |
| 152 | | | | | | | | |
| 153 | | | | | | | | |
| 154 | | | | | | | | |
| 155 | | | | | 1.5 ppm | | | |
| 156 | | | | | | | | |
| 157 | | | | | | | | |
| 158 | | | | | | | | |
| 159 | | | | | | | | |
| 160 | | 19 | 120/120 | | 1.4 ppm | Loose, gray, Silty SAND, moist. Changing at 165.0 feet to: Dense, gray, CLAY, some fine Sand, moist. | | |
| 161 | | | | | | | | |
| 162 | | | | | | | | |
| 163 | | | | | | | | |
| 164 | | | | | | | | |
| 165 | | | | | 3.9 ppm | | 165' CLAY | |
| 166 | | | | | | | | |
| 167 | | | | | | | | |
| 168 | | | | | | | | |
| 169 | | | | | | | | |

**Gamma (API-GR)**




**Well Diagram**



**REMARKS**

6. Temporary well pushed to 140.0 feet below ground surface. Groundwater collected for laboratory analytical testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

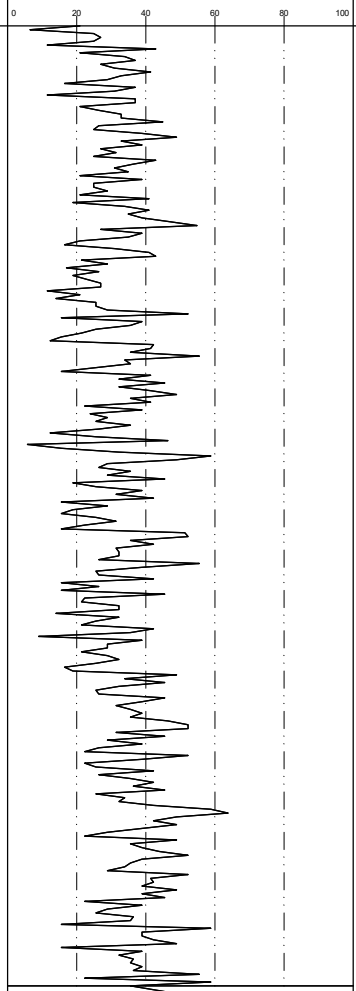
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
MDEQ Drilling
Rockford, Michigan

**Boring No.:** HS-MW-32D
**Page:** 6 **of** 6
**File No.:** 16.0062335.52
**Check:** Lori Powers

| Depth | Elevation (ft, ) | Sample Information No. | Pen./ Rec. (in.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | 20 | 120/120 | | 2.9 ppm | Dense, gray, CLAY, trace fine Sand, moist. | CLAY | |
| 171 | | | | | | | | |
| 172 | | | | | | | | |
| 173 | | | | | | | | |
| 174 | | | | | | | | |
| 175 | | | | | 1.7 ppm | | | |
| 176 | | | | | | | | |
| 177 | | | | | | | | |
| 178 | | | | | | | | |
| 179 | | | | | | | | |
| 180 | | 21 | 120/120 | | 1.9 ppm | Dense, gray CLAY, moist. | | |
| 181 | | | | | | | | |
| 182 | | | | | | | | |
| 183 | | | | | | | | |
| 184 | | | | | | | | |
| 185 | | | | | 2.3 ppm | | | |
| 186 | | | | | | | | |
| 187 | | | | | | | | |
| 188 | | | | | | | | |
| 189 | | | | | | | | |
| 190 | | 22 | 60/60 | | 2.1 ppm | Dense, gray, CLAY, moist. | | 7 |
| 191 | | | | | | | | |
| 192 | | | | | | | | |
| 193 | | | | | 2.8 ppm | | | |
| 194 | | | | | | | | |
| 195 | | | | | | | 195' | |
| | | | | | | Bottom of Borehole at 195.0 Feet | | |
| 196 | | | | | | | | |
| 197 | | | | | | | | |
| 198 | | | | | | | | |
| 199 | | | | | | | | |
| 200 | | | | | | | | |
| 201 | | | | | | | | |
| 202 | | | | | | | | |
| 203 | | | | | | | | |
| 204 | | | | | | | | |

**Gamma (API-GR)**




**Well Diagram**

**REMARKS**

7. Driller mentioned possible bedrock at 195.0 feet.
Monitoring well was installed in borehole upon completion. Well screen set from 137.6 to 142.2 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** HS-MW-32D

COPY OF GAMMA LOG 62335.52 MDEQ WWW.GPJ GZA_CORP.GDT 4/20/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV1
**Page:** 1 **of** 5
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** SAC / JTM
**Date Start/Finish:** 1-29-18 / 2-5-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

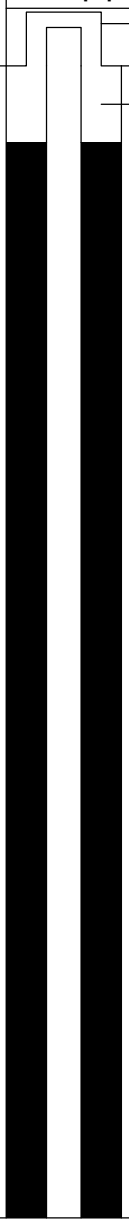
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/24 | 0-2 | 8-7 3-3 | ND | SAND, TOPSOIL and ORGANIC MATTER (roots)(FILL). Changing at 0.2 feet to: Loose, orange, fine SAND, moist (FILL). | 0.2' SAND / TOPSOIL / ORGANIC MATTER (FILL) | 1 |
| 2 3 | 2 | 24/18 | 2-4 | 4-3 3-4 | ND | Loose, brown, SILT and SAND, moist. | 2' SAND (FILL) | |
| 4 5 | 3 | 24/24 | 4-6 | 2-2 2-2 | ND | Very loose, brown, fine SAND, some Silt, moist. | SAND | |
| 6 7 | 4 | 24/24 | 6-8 | 6-9 11-15 | ND | Medium dense, brown, fine SAND, some Silt, trace small Gravel, dry. | | |
| 8 9 | 5 | 24/24 | 8-10 | 4-7 10-3 | ND | Medium dense, brown, fine SAND, some Silt, trace small Gravel, dry. (1.0 inch Gravel at 9.0 feet) | | |
| 10 11 | 6 | 24/24 | 10-12 | 2-4 10-12 | ND | Medium dense, brown, SILT, some fine Sand, trace Gravel, dry. | 10' SILT | |
| 12 13 | 7 | 24/24 | 12-14 | 2-4 14-17 | ND | Medium dense, brown, SILT, some fine Sand, trace Gravel, Iron staining in fractures, dry. | | |
| 14 15 | 8 | 24/24 | 14-16 | 6-12 20-21 | ND | Dense, brown, SILT, some fine Sand, trace Gravel, Iron staining in fractures, dry. | | |
| 16 17 | 9 | 24/24 | 16-18 | 6-10 15-19 | ND | Medium dense, brown, SILT, some fine Sand, trace Gravel, Iron staining in fractures, dry. | | |
| 18 19 | 10 | 24/24 | 18-20 | 3-8 15-17 | ND | Medium dense, brown, SILT, some fine Sand, trace Gravel, dry. (1.0 inch Gravel at 19.0 feet) | | |
| 20 21 | 11 | 24/24 | 20-22 | 4-13 16-18 | ND | Medium dense, brown, SILT, some fine Sand, trace Gravel, Iron staining in fractures, dry. | | |
| 22 23 | 12 | 24/24 | 22-24 | 28-10 19-20 | ND | Medium dense, brown grading to grayish brown at 23.5 feet, SILT, some very fine Sand, trace Gravel, dry. | | |
| 24 25 | 13 | 24/24 | 24-26 | 5-8 11-12 | ND | Medium dense, grayish brown, SILT, some fine Sand (Gray, Clay from 24.5 to 24.75 feet, dry). | | |
| 26 27 | 14 | 24/24 | 26-28 | 5-7 11-13 | ND | Medium dense, gray, SILT, some Clay, trace fine Sand, trace Gravel, dry. | | |
| 28 29 | 15 | 24/24 | 28-30 | 3-4 6-7 | ND | Medium dense, gray, SILT, some Clay, moist to wet. | | |

**Equipment Installed**




**REMARKS**

1. Field screeing of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV1

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV1
**Page:** 2 **of** 5
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 16 | 24/24 | 30-32 | 2-3 6-0 | ND | Loose, gray, SILT, some Clay, moist. | SILT | | |
| 31 | | | | | | | | 2 | |
| 32 | 18 | 24/0 | 32-34 | 27-37 41-27 | - | Rock stuck in tip of split spoon. | | | |
| 33 | | | | | | | | | |
| 34 | 19 | 24/24 | 34-36 | 2-5 12-12 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 35 | | | | | | | | | |
| 36 | 20 | 24/24 | 36-38 | 4-7 11-12 | ND | Medium dense, gray, SILT, some Clay, moist. (1.0 inch Gravel at 36.5 feet) | | | |
| 37 | | | | | | | | | |
| 38 | 21 | 24/24 | 38-40 | 3-9 12-13 | ND | Medium dense, gray, SILT, some Clay, some Gravel, moist. | | | |
| 39 | | | | | | | | | |
| 40 | 22 | 24/24 | 40-42 | 5-9 11-16 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 41 | | | | | | | | | |
| 42 | 23 | 24/24 | 42-44 | 4-8 10-13 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. (Sand from 43.0 to 43.25 feet) | | | |
| 43 | | | | | | | | | |
| 44 | 24 | 24/24 | 44-46 | 5-11 15-18 | ND | Medium dense, gray, SILT, some Clay, trace Gravel. (1.0-inch Sand seam at 45.0 feet) | | | |
| 45 | | | | | | | | | |
| 46 | 25 | 24/24 | 46-48 | 4-7 14-15 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 47 | | | | | | | | | |
| 48 | 26 | 24/24 | 48-50 | 6-4 14-15 | ND | Medium dense, gray, SILT, some Clay, moist. (very moist to wet ground Rock at 49.0 feet) | | | |
| 49 | | | | | | | | | |
| 50 | 27 | 24/24 | 50-52 | 2-2 5-9 | ND | Loose, gray, SILT, some Clay, trace Gravel, moist. (very moist Sand seams from 51.0 to 51.2 feet) | | | |
| 51 | | | | | | | | | |
| 52 | 28 | 24/24 | 52-54 | 2-8 11-14 | ND | Medium dense, gray, SILT, some Clay, moist. (trace Gravel at 53.5 feet) | | | |
| 53 | | | | | | | | | |
| 54 | 30 | 24/24 | 54-56 | 6-10 14-15 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 55 | | | | | | | | | |
| 56 | 31 | 24/24 | 56-58 | 5-8 14-16 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 57 | | | | | | | | | |
| 58 | 32 | 24/24 | 58-60 | 5-11 16-17 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 59 | | | | | | | | | |
| 60 | 33 | 24/24 | 60-62 | 3-8 13-13 | ND | Loose, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 61 | | | | | | | | | |
| 62 | 34 | 24/24 | 62-64 | 5-7 14-15 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 63 | | | | | | | | | |
| 64 | 35 | 24/24 | 64-66 | 6-11 15-18 | ND | Medium dense, gray, SILT, some Clay, | | | Bentonite Grout |

**REMARKS**

2. Groundwater was encountered at approximately 31.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV1

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV1
**Page:** 3 **of** 5
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 66 | 36 | 24/24 | 66-68 | 4-10 14-15 | ND | trace Gravel, moist. Changing at 64.5 feet to: Gray, SILT, some Clay, trace Gravel, moist. | SILT | | |
| 67 | | | | | | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 68 | 37 | 24/24 | 68-70 | 4-5 11-14 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 69 | | | | | | | | | |
| 70 | 38 | 24/24 | 70-72 | 6-12 10-21 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 71 | | | | | | | | | |
| 72 | 39 | 24/24 | 72-74 | 5-8 22-17 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. (loose, wet seam at 73.0 feet) | | | |
| 73 | | | | | | | | | |
| 74 | 40 | 24/24 | 74-76 | 12-20 21-24 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 75 | | | | | | | | | |
| 76 | 41 | 24/24 | 76-78 | 6-11 16-22 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 77 | | | | | | | | | |
| 78 | 42 | 24/24 | 78-80 | 5-13 17-20 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 79 | | | | | | | | | |
| 80 | 43 | 24/24 | 80-82 | 8-12 15-21 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 81 | | | | | | | | | |
| 82 | 44 | 24/24 | 82-84 | 4-9 13-18 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 83 | | | | | | | | | |
| 84 | 45 | 24/24 | 84-86 | 6-13 17-26 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 85 | | | | | | | | | |
| 86 | 46 | 24/24 | 86-88 | 7-14 22-28 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. (1.0-inch Gravel at 87.5 feet) | | | |
| 87 | | | | | | | | | |
| 88 | 47 | 24/24 | 88-90 | 7-15 28-27 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 89 | | | | | | | | | |
| 90 | 48 | 24/24 | 90-92 | 10-18 26-29 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 91 | | | | | | | | | |
| 92 | 49 | 24/12 | 92-94 | 8-16 24-31 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 93 | | | | | | | | | |
| 94 | 50 | 24/24 | 94-96 | 11-27 33-37 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 95 | | | | | | | | | |
| 96 | 51 | 24/24 | 96-98 | 10-24 36-39 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 97 | | | | | | | | | |
| 98 | 52 | 24/24 | 98-100 | 7-17 26-27 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 99 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV1
**Page:** 4 **of** 5
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 53 | 24/24 | 100-102 | 8-20 25-28 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | SILT | | |
| 101 | | | | | | | | | |
| 102 | 54 | 24/24 | 102-104 | 10-21 27-39 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 103 | | | | | | | | | |
| 104 | 55 | 24/21 | 104-106 | 8-17 23-27 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. (0.5-inch sand seam at 105.3 feet) | | | |
| 105 | | | | | | | | | |
| 106 | 56 | 24/24 | 106-108 | 9-18 27-35 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 107 | | | | | | | | | |
| 108 | 58 | 24/12 | 108-110 | 10-28 36-45 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 109 | | | | | | | | | |
| 110 | 59 | 24/24 | 110-112 | 15-23 31-47 | ND | Very dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 111 | | | | | | | | | |
| 112 | 60 | 24/24 | 112-114 | 10-22 29-44 | ND | Very dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 113 | | | | | | | | | |
| 114 | 61 | 24/24 | 114-116 | 7-24 27-35 | ND | Very dense, gray, SILT, some Clay, trace Gravel, moist. (1.0 inch gravel piece at 115.0 feet) | | | |
| 115 | | | | | | | | | |
| 116 | 62 | 24/24 | 116-118 | 18-28 34-40 | ND | Very dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 117 | | | | | | | | | |
| 118 | 63 | 24/18 | 118-120 | 10-12 15-27 | ND | Medium dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 119 | | | | | | | | | |
| 120 | 64 | 24/24 | 120-122 | 14-23 27-35 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 121 | | | | | | | | | |
| 122 | 65 | 24/24 | 122-124 | 13-19 25-32 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 123 | | | | | | | | | |
| 124 | 65 | 24/24 | 124-126 | 9-14 21-27 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 125 | | | | | | | | | |
| 126 | 66 | 24/24 | 126-128 | 11-15 22-30 | ND | Dense, gray, SILT, some Clay, trace Gravel, moist. | | | |
| 127 | | | | | | | | | |
| 128 | 67 | 24/24 | 128-130 | 6-10 16-24 | ND | Medium dense, grayish brown, SILT, some Clay, little fine Sand, trace Gravel, moist. Changing at 129.0 feet to: Grayish brown, SILT, some Clay, little fine Sand, trace Gravel, moist to wet. | | | 2--Inch PVC Riser |
| 129 | | | | | | | | | |
| 130 | 68 | 24/24 | 130-132 | 6-8 9-9 | ND | | 131' | | |
| 131 | | | | | | | SAND | | |
| 132 | 70 | 24/0 | 132-134 | 6-7 8-11 | - | Medium dense, grayish brown, SILT, some Clay, little fine Sand, trace Gravel, moist to wet. Changing at 131.0 feet to: Tan, fine SAND, wet. NO RECOVERY. | | | |
| 133 | | | | | | | | | |
| 134 | 71 | 24/12 | 134-136 | 18-25 42-50 | ND | Very dense, tan, fine SAND, wet. | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV1

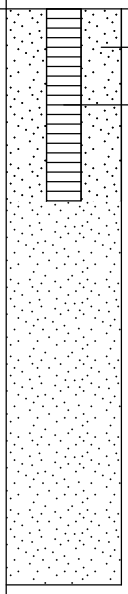
BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV1
**Page:** 5 **of** 5
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 136 | 72 | 24/24 | 136-138 | 4-50/3" | ND | Very dense, tan, fine SAND, wet. | | | Filter Sand |
| 137 | | | | | | | | | 2-Inch PVC Well Screen |
| 138 | | | | | | | | | |
| 139 | | | | | | | | | |
| 140 | 73 | 24/12 | 140-142 | 42-50/5" | 3.2 ppmv | Very dense, Grayish brown, well sorted, fine to medium SAND, trace Silt, trace Clay, moist to wet. | | | |
| 141 | | | | | | | | | |
| 142 | 74 | 24/18 | 142-144 | 23-37 20/6"-- | 3.4 ppmv | Hard, dark gray, SILT & CLAY, trace Sand, trace Gravel, moist. | 142' SILT & CLAY | | |
| 143 | | | | | | | | | |
| 144 | 75 | 24/18 | 144-146 | 22-41-50->50 | 4.1 ppmv | Hard, dark gray, SILT & CLAY, trace Sand, trace Gravel, moist. | | | |
| 145 | | | | | | | | | |
| 146 | | | | | | | | | |
| 147 | | | | | | | | | |
| 148 | 76 | 24/18 | 148-150 | 23-31-50->50 | 4.3 ppmv | Hard, dark gray, poorly sorted, SILT & CLAY, trace Sand, trace Gravel, plastic, cohesive, moist. | | | |
| 149 | | | | | | | | | |
| 150 | | | | | | Bottom of Borehole at 150.0 Feet | 150' | 3 | |
| 151 | | | | | | | | | |
| 152 | | | | | | | | | |
| 153 | | | | | | | | | |
| 154 | | | | | | | | | |
| 155 | | | | | | | | | |
| 156 | | | | | | | | | |
| 157 | | | | | | | | | |
| 158 | | | | | | | | | |
| 159 | | | | | | | | | |
| 160 | | | | | | | | | |
| 161 | | | | | | | | | |
| 162 | | | | | | | | | |
| 163 | | | | | | | | | |
| 164 | | | | | | | | | |
| 165 | | | | | | | | | |
| 166 | | | | | | | | | |
| 167 | | | | | | | | | |
| 168 | | | | | | | | | |
| 169 | | | | | | | | | |



**REMARKS**

3. Monitoring well was installed in borehole upon completion. Well screen set from 135.0 to 140.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV1

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV2
**Page:** 1 **of** 2
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 2-14-18 / 2-14-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

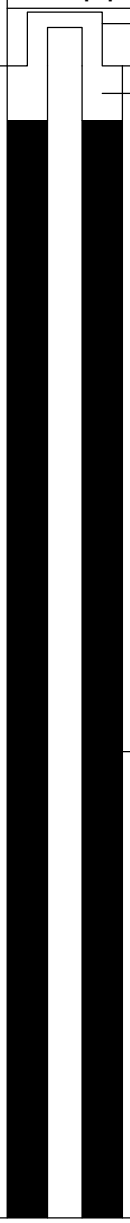
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/24 | 0-2 | 1-1 1-1 | ND | Very loose, black, fine to medium SAND and SILT, trace Clay. | SAND and SILT | 1 |
| 2 3 | 2 | 24/18 | 2-4 | 1-1 1-1 | ND | Very loose, black, fine to medium SAND and SILT, some Wood Fragments. | | |
| 4 5 | 3 | 24/4 | 4-6 | 0-1 1-1 | ND | Very loose, black, SILT and fibrous PEAT. | 4' SILT and PEAT | |
| 6 7 | 4 | 24/12 | 6-8 | 0-0 1-1 | ND | Very loose, black, SILT and fibrous PEAT, wet. | | |
| 8 9 | 5 | 24/18 | 8-10 | 1-0 1-1 | ND | Very loose, brown, fine SAND, some Silt, wet. | 8' SAND and SILT | |
| 10 11 | 6 | 24/18 | 10-12 | 2-2 1-1 | ND | Very loose, brown, fine SAND and SILT, wet. | | |
| 12 13 | 7 | 24/24 | 12-14 | 1-4 4-4 | ND | Loose, brown, fine to medium SAND and SILT, some Gravel, Some Clay lenses, wet. | | 2 |
| 14 15 | 8 | 24/17 | 14-16 | 1-2 3-2 | ND | Loose, brown, fine to medium SAND and SILT, some Gravel, wet. | | |
| 16 17 | 9 | 24/12 | 16-18 | 1-1 3-3 | ND | Loose, brown, fine SAND and SILT, wet. | | |
| 18 19 | 10 | 24/18 | 18-20 | 1-2 2-3 | ND | Loose, brown, fine SAND and SILT, trace Clay, wet. | | |
| 20 | 11 | 24/12 | 20-22 | 1-2 2-2 | ND | Loose, brown, fine SAND and SILT, trace Clay, wet. | | |

**Equipment Installed**




**REMARKS**

1. Field screeing of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).
2. A groundwater sample was collected from a temporary monitoring with a well screen set at approximately 13.0 to 18.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV2

BORING_WELL_6267781 WWW.WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

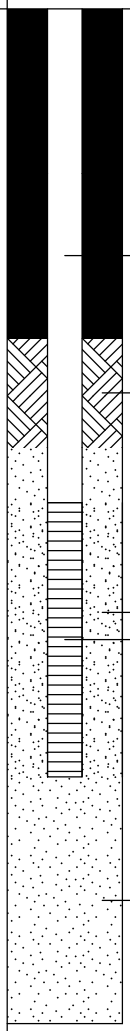
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV2
**Page:** 2 **of** 2
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND and SILT | |
| 22–23 | 12 | 24/12 | 22-24 | 1-1<br>1-1 | ND | Very loose, brown, fine SAND and SILT, wet. | | |
| 24–25 | 13 | 24/24 | 24-26 | 2-3<br>2-3 | ND | Loose, brown, fine to medium SAND and SILT, wet. Changing at 25.5 feet to: Tan, CLAY, wet. | 25.5' CLAY | |
| 26–27 | 14 | 24/18 | 26-28 | 2-2<br>2-2 | ND | Soft, tan, CLAY, wet (CL). | | |
| 28–29 | 15 | 24/12 | 28-30 | 2-3<br>11-10 | ND | Stiff, tan, CLAY, wet. Changing at 28.5 feet to: Fine to coarse SAND and GRAVEL, wet. | 28.5' SAND and GRAVEL | 3 |
| 30–31 | 16 | 24/0 | 30-32 | 8-17<br>18-21 | ND | NO RECOVERY. | | 4 |
| 32–33 | 17 | 24/13 | 32-34 | 6-8<br>9-12 | ND | Medium dense, brown, fine to coarse SAND and Gravel, trace Silt, wet. | | |
| 34–35 | 18 | 24/6 | 34-36 | 7-9<br>10-21 | ND | Medium dense, gray, SILT, trace fine to medium Sand, wet. | 34' SILT | |
| 36–37 | 19 | 24/15 | 36-38 | 10-16<br>22-45 | ND | Hard, gray, CLAY, some Silt, some fine to medium Sand, wet. | 36' CLAY | |
| 38–39 | 20 | 18/18 | 38-39.5 | 12-32-75/6" | ND | Very dense, gray, fine to medium SAND and SILT, some Gravel, wet (GLACIAL TILL). | 38' SAND (GLACIAL TILL) 39.5' | |
| 40–45 | | | | | | Bottom of Borehole at 39.5 Feet | | |

**Equipment Installed**




**REMARKS**

3. Gravel stuck in tip of split spoon.
4. Groundwater sample was collected from temporary monitoring well with screen set at approximately 31.0 to 36.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV2

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV2S
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 2-14-18 / 2-14-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

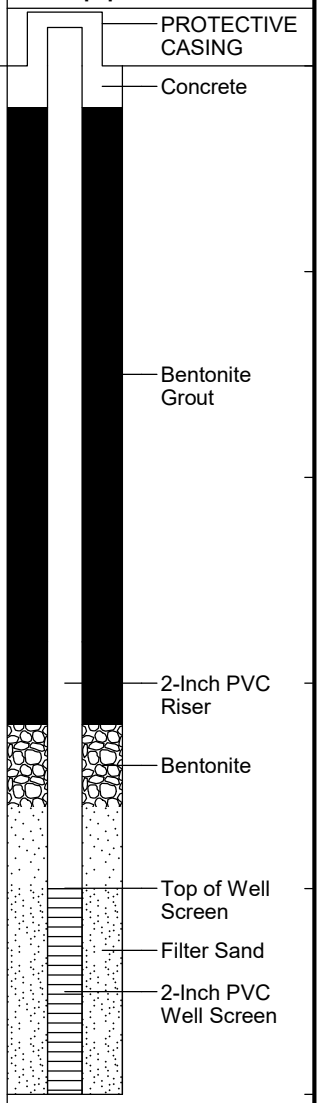
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–24 | | | | | | See MW-WV2 boring log for soil descriptions. | | |
| 25 | | | | | | Bottom of Borehole at 25.0 Feet | | 1 |
| 26–27 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 20.0 to 25.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV2S

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV3
**Page:** 1 **of** 3
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse/Anthony Leonido
**Date Start/Finish:**
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

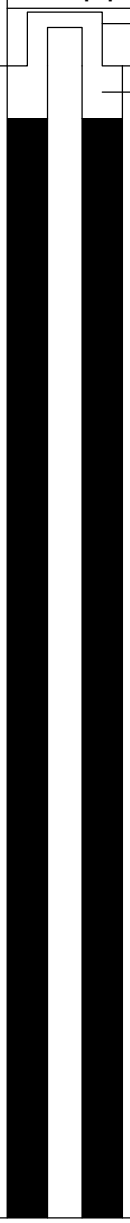
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/24 | 0-2 | 1-1 3-3 | ND | Very loose, dark brown, fine to medium SAND, little Clay, little Silt, little Organic Matter (wood, leaves), moist. Changing at 0.3 feet to: Brown, fine to medium SAND, little Silt, moist. Changing at 1.5 feet to: Brown and gray, CLAY & SILT, little fine to medium Sand, trace Organic Matter (roots), moist. Changing at 1.8 feet to: Brown, fine to medium SAND, trace Silt, wet. | SAND<br>1.5'<br>1.8' CLAY & SILT<br>SAND | 1 |
| 2 | 2 | 24/19 | 2-4 | 3-4 5-6 | ND | | | 2 |
| 3 | 3 | 24/15 | 4-6 | 1-1 2-2 | ND | Loose, brown, fine to medium SAND, trace Silt, wet. Very loose, gray, fine to medium SAND, trace Silt, trace fine Gravel, wet. | | 3 |
| 6 | 4 | 24/16 | 6-8 | 0-1 1-2 | ND | Very loose, brown, fine to medium SAND, trace Silt, trace Organic Matter (wood fragments, leaves), trace Hair, wet. | | |
| 8 | 5 | 24/19 | 8-10 | 0-0 1-1 | ND | Very loose, brown, fine to medium SAND, trace Silt, trace Organic Matter (leaves), trace Hair, wet. | | |
| 10 | 6 | 24/21 | 10-12 | 2-3 3-3 | ND | Loose, gray, fine to medium SAND, trace Silt, wet. | | |
| 12 | 7 | 24/16 | 12-14 | 0-1 1-2 | ND | Very loose, brown, fine to medium SAND, trace Silt, trace fine Gravel, wet. | | |
| 14 | 8 | 24/16 | 14-16 | 2-3 3-4 | ND | Loose, brown, fine to medium SAND, trace Silt, wet. | | 4 |
| 16 | 9 | 24/24 | 16-18 | 4-6 9-10 | ND | Medium dense, fine to medium SAND, trace Silt, wet. Changing at 17.0 feet to: Gray, Silty CLAY, trace fine to coarse Sand, moist. | 17'<br>Silty CLAY | |
| 18 | 10 | 24/18 | 18-20 | 4-8 8-9 | ND | Very stiff, gray, Silty CLAY, trace fine to coarse Sand, moist. | | |
| 20 | 11 | 24/18 | 20-22 | 4-8 9-9 | ND | Very stiff, gray, SILT, trace Gravel, trace Clay, wet. | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).
2. Groundwater was encountered at approximately 1.8 feet below ground surface.
3. A groundwater sample was collected from a temporary well with a well screen set at approximately 5.0 to 10.0 feet below ground surface and submitted for laboratory analytical testing.
4. A groundwater sample was collected from a temporary well with a well screen set at approximately 15.0 to 20.0 feet below ground surface and submitted for laboratory analytical testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV3

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV3
**Page:** 2 **of** 3
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 12 | 24/18 | 22-24 | 3-5 6-9 | ND | Stiff, gray, Silty CLAY, trace fine Sand, wet. | Silty CLAY | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/18 | 24-26 | 3-8 9-10 | ND | Very stiff, brown to gray bands, Silty CLAY, trace fine Sand, wet. | | | Bentonite Grout |
| 25 | | | | | | | | | |
| 26 | 14 | 24/17 | 26-28 | 5-6 9-7 | ND | Stiff, gray, SILT, trace medium Sand, wet. | 26' SILT | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/15 | 28-30 | 2-3 4-4 | ND | Loose, gray, fine SAND and SILT, trace Clay, wet. | 28' SAND and SILT | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/8 | 30-32 | 1-2 2-3 | ND | Very loose, brown, fine SAND, trace Silt, wet. | 30' SAND | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/8 | 32-34 | 1-2 2-4 | ND | Very loose, brown, fine SAND, trace Silt, wet. | | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/12 | 34-36 | 1-3 3-5 | ND | Loose, brown, fine SAND, trace Silt, wet. | | 5 | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/9 | 36-38 | 1-2 4-5 | ND | Loose, brown, fine SAND, trace Silt, wet. | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/10 | 38-40 | 1-1 2-6 | ND | Very loose, brown, fine to medium SAND, trace Silt, wet. | | | |
| 39 | | | | | | | | | |
| 40 | 21 | 24/11 | 40-42 | 3-8 10-11 | ND | Medium dense, brown, fine SAND, trace Gravel, trace Silt, wet. | | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/12 | 42-44 | 15-19 21-20 | ND | Dense, brown, fine to medium SAND, trace Silt, wet. | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/15 | 44-46 | 6-14 21-25 | ND | Dense, brown, fine to medium SAND, trace Silt, wet. | | 6 | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/20 | 46-48 | 4-16 23-24 | ND | Dense, brown, fine to medium SAND, trace Silt, wet. | | | |
| 47 | | | | | | | | | |

**REMARKS**

5. A groundwater sample was collected from a temporary well with a well screen from approximately 34.0 to 39.0 feet below ground surface and submitted for laboratory analytical testing.
6. A groundwater sample was collected from a temporary well with a well screen from approximately 44.0 to 49.0 feet below ground surface and submitted for laboratory analytical testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV3

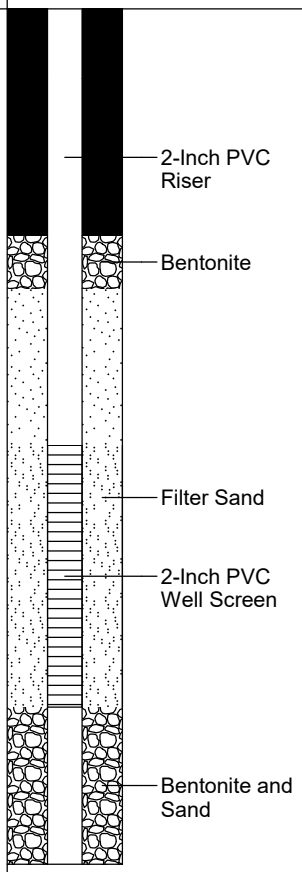
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV3
**Page:** 3 **of** 3
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 48 | 25 | 24/15 | 48-50 | 4-8 11-15 | ND | Medium dense, brown, fine SAND, wet. | SAND | |
| 49 | | | | | | | | |
| 50 | 26 | 24/15 | 50-52 | 8-18 22-35 | ND | Dense, fine to medium SAND, trace Silt, wet. | | |
| 51 | | | | | | | | |
| 52 | 27 | 24/20 | 52-54 | 4-9 21-29 | ND | Dense, brown, fine SAND, trace Silt, wet. | | |
| 53 | | | | | | | | |
| 54 | 28 | 24/20 | 54-56 | 2-6 17-21 | ND | Medium dense, brown, fine to medium SAND, trace Silt, wet. | | 7 |
| 55 | | | | | | | | |
| 56 | 29 | 24/3 | 56-58 | 3-8 12-15 | ND | Medium dense, gray and brown, fine to coarse SAND and GRAVEL, wet. | 56' SAND and GRAVEL | 8 |
| 57 | | | | | | | | |
| 58 | 30 | 24/12 | 58-60 | 3-4 13-16 | ND | Medium dense, brown, fine to coarse SAND and GRAVEL, wet. | | |
| 59 | | | | | | | | |
| 60 | 31 | 24/18 | 60-62 | 4-6 8-9 | ND | Medium dense, brown, fine to coarse SAND and Gravel, trace Silt, wet. Changing at 61.0 feet to: Tan, CLAY, wet. | | |
| 61 | | | | | | | 61' CLAY | |
| 62 | 32 | 24/20 | 62-64 | 8-11 11-12 | ND | Very stiff, tan, CLAY, wet. | | |
| 63 | | | | | | | | |
| 64 | | | | | | Bottom of Borehole at 64.0 Feet | 64' | 8 |
| 65 | | | | | | | | |
| 66 | | | | | | | | |
| 67 | | | | | | | | |
| 68 | | | | | | | | |
| 69 | | | | | | | | |
| 70 | | | | | | | | |
| 71 | | | | | | | | |
| 72 | | | | | | | | |
| 73 | | | | | | | | |

**Equipment Installed**




**REMARKS**

7. A groundwater sample was collected from a temporary well with a well screen from approximately 54.0 to 59.0 feet below ground surface and submitted for laboratory analytical testing.
8. Gravel stuck in tip of split spoon.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV3

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV3S
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Anthony Leonido
**Date Start/Finish:**
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

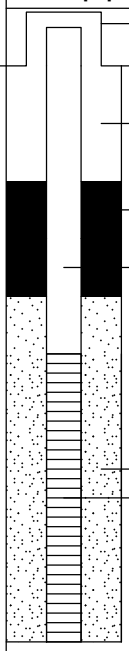
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-WV3 boring log for soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | Bottom of Borehole at 10.1 Feet | | 1 |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 5.0 to 10.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV3S

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV4
**Page:** 1 **of** 6
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Anthony Leonido
**Date Start/Finish:** 3-12-18 / 3-12-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

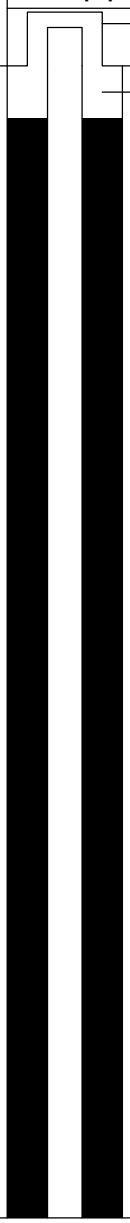
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| 3/16/18 | 1600 | 84.0' | Open | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/24 | 0-2 | 1-1<br>1-1 | ND | TOPSOIL. Changing at 0.5 feet to: Very loose, brown and black, fine to medium SAND and SILT, dry. | 0.5' TOPSOIL (LOAM)<br>SAND and SILT | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | 2 | 24/18 | 4-6 | 1-1<br>2-3 | 0.1 | Very loose, brown, fine SAND, little Silt, dry. | | 1 |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | 3 | 24/20 | 9-11 | 3-4<br>6-6 | ND | Loose, brown, fine SAND, trace Silt, dry. | 9'<br>SAND | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | 13'<br>SAND and SILT | |
| 14 | 4 | 24/18 | 14-16 | 4-5<br>5-7 | ND | Loose, brown, fine SAND, dry. Changing at 15.0 feet to: Tan, fine SAND and SILT, dry (SM). | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | 5 | 24/20 | 19-21 | 5-10<br>19-21 | ND | Medium dense, brown, SILT, trace fine Sand, dry. | 19'<br>SILT | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million per volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV4

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV4
**Page:** 2 **of** 6
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SILT | | |
| 23 | | | | | | | | | |
| 24 | 6 | 24/20 | 24-26 | 8-13<br>13-17 | 0.1 | Medium dense, brown, fine SAND, trace Silt, dry. | 24'<br>SAND | | |
| 25 | | | | | | | | | |
| 26 | | | | | | | | | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | 7 | 24/22 | 29-31 | 2-5<br>8-12 | ND | Medium dense, brown, fine SAND, trace Silt, dry. | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | 8 | 24/20 | 34-36 | 3-10<br>14-15 | ND | Medium dense, brown, fine SAND, trace Silt, dry. | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | 9 | 24/24 | 39-41 | 5-12<br>17-21 | ND | Medium dense, brown, fine SAND, trace Silt, dry. | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | 10 | 24/22 | 44-46 | 8-21<br>22-30 | ND | Dense, brown, fine SAND and fine GRAVEL, trace Silt. | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV4

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV4
**Page:** 3 **of** 6
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 48 | | | | | | | SAND | | |
| 49 | 11 | 24/21 | 49-51 | 3-11<br>22-28 | ND | Dense, brown, fine to medium SAND and SILT, dry. | 49'<br>SAND and SILT | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | 12 | 11/11 | 54-54.9 | 16-50/5" | ND | Very dense, brown, fine SAND and SILT, some medium Gravel, dry. | | 2 | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | 13 | 24/24 | 59-61 | 21-30<br>39-50 | ND | Very dense, brown, fine to coarse SAND and SILT, trace medium Gravel, dry (GLACIAL TILL). | 59'<br>SAND and SILT (GLACIAL TILL) | | |
| 60 | | | | | | | | | Bentonite Grout |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | 14 | 24/24 | 64-66 | 11-21<br>24-27 | ND | Hard, gray, Silty CLAY, dry. | 64'<br>Silty CLAY | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | 15 | 24/19 | 69-71 | 19-43<br>38-46 | ND | Very dense, gray, fine SAND and SILT with Clay lenses, trace medium Sand, dry (GLACIAL TILL). | 69'<br>SAND and SILT (GLACIAL TILL) | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |

**REMARKS**

2. Split spoon refusal at approximately 55.0 feet.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV4

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV4
**Page:** 4 **of** 6
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 74 | 16 | 24/24 | 74-76 | 8-14<br>24-31 | ND | Dense, gray, fine to medium SAND and SILT, some Clay, damp (GLACIAL TILL). | SAND and SILT (GLACIAL TILL) | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | 17 | 18/18 | 79-80.5 | 13-27<br>37-0 | ND | Dense, gray, fine to medium SAND and SILT, some Clay, damp (GLACIAL TILL). | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | 4 | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | 18 | 10/0 | 84-84.8 | 28-50/4" | ND | NO RECOVERY. | | 3 | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | 19 | 24/24 | 89-91 | 8-13<br>19-25 | ND | Dense, gray, fine SAND and SILT, some medium Gravel, moist (GLACIAL TILL). | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | 20 | 24/24 | 94-96 | 14-24<br>28-41 | ND | Very dense, gray, fine SAND and SILT, some medium Gravel, moist (GLACIAL TILL). | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |

**REMARKS**

4. Split spoon refusal at approximately 80.5 feet.
3. Gravel stuck in tip of split spoon.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV4

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV4
**Page:** 5 **of** 6
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/24 | 99-101 | 19-18 20-31 | ND | Dense, gray, fine SAND and SILT, some medium Gravel, dry (GLACIAL TILL). | SAND and SILT (GLACIAL TILL) | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | 22 | 24/24 | 104-106 | 13-20 30-50 | ND | Very dense, gray, fine SAND and SILT, some medium Gravel, dry (GLACIAL TILL). | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | 23 | 24/24 | 109-111 | 9-12 24-42 | ND | Dense, gray, fine SAND and SILT, some medium Gravel, damp (GLACIAL TILL). | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | 24 | 24/24 | 114-116 | 9-17 28-41 | ND | Dense, gray, fine SAND and SILT, some medium Gravel, damp (GLACIAL TILL). | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | |
| 119 | 25 | 24/24 | 119-121 | 8-15 31-50 | ND | Dense, gray, fine SAND and SILT, some medium Gravel, damp (GLACIAL TILL). | | | |
| 120 | | | | | | | | | |
| 121 | | | | | | | | | |
| 122 | | | | | | | | | 2-Inch PVC Riser |
| 123 | | | | | | | | | |
| 124 | 26 | 18/18 | 124-125.5 | 9-27-50/6" | 10.7 | Very dense, gray, fine SAND and SILT, | | 5 | |

**REMARKS**

5. Groundwater was encountered at approximately 123.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV4

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

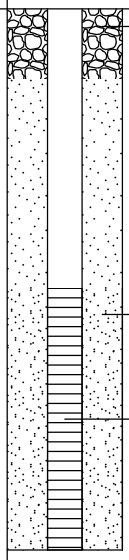
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV4
**Page:** 6 **of** 6
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 125 | | | | | | some medium Gravel, damp, with green, fine Sand and Silt lenses and blue, fine Sand and Silt lenses, damp (GLACIAL TILL). | SAND and SILT (GLACIAL TILL) | 6 |
| 126 | | | | | | | | |
| 127 | | | | | | | | |
| 128 | 27 | 15/12 | 128-129.3 | 15-35-50/3" | 5.0 | Very dense, brown, fine to medium SAND, trace Silt, wet, with layer of green, fine SAND. | 128' SAND | |
| 129 | | | | | | | | |
| 130 | | | | | | | | |
| 131 | | | | | | | | |
| 132 | | | | | | | | |
| 133 | | | | | | | 133' Silty SAND and CLAY | |
| 134 | 28 | 12/12 | 134-135 | 17-50+ | ND | Very dense, red and green, fine Silty SAND, some Silty Clay, wet. | 135' | |
| 135 | | | | | | Bottom of Borehole at 135.0 Feet | | 7 |
| 136 | | | | | | | | |
| 137 | | | | | | | | |
| 138 | | | | | | | | |
| 139 | | | | | | | | |
| 140 | | | | | | | | |
| 141 | | | | | | | | |
| 142 | | | | | | | | |
| 143 | | | | | | | | |
| 144 | | | | | | | | |
| 145 | | | | | | | | |
| 146 | | | | | | | | |
| 147 | | | | | | | | |
| 148 | | | | | | | | |
| 149 | | | | | | | | |
| 150 | | | | | | | | |

**Equipment Installed**




**REMARKS**

6. A temporary well screen was set from 125.0 to 130.0 below ground surface. Groundwater sample was collected and submitted for laboratory analytical testing.
7. Monitoring well was installed in the borehole upon completion. Well screen set from 130.0 to 135.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV4

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV5D
**Page:** 1 **of** 3
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Joe Workman
**Date Start/Finish:** 3-14-18 / 3-14-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

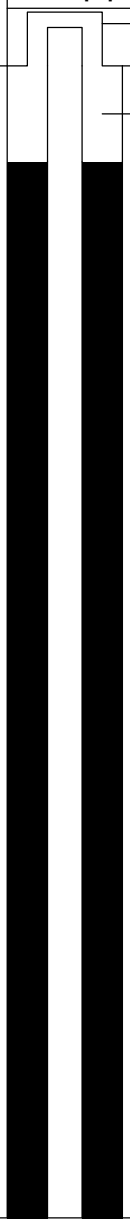
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| 3/14/18 | 1005 | 64.4' | Top of PVC | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/13 | 0-2 | 2-3 5-6 | 9.0 | Loose, dark brown, fine to medium SAND, trace Organic Matter (roots), trace Clay, trace Silt, damp. Changing at 1.0 foot to: Brown, fine to medium SAND, trace Silt, damp. | SAND | 1 |
| 2 | 2 | 24/11 | 2-4 | 3-4 4-5 | 3.0 | Loose, brown, fine to medium SAND, trace Silt, damp (rock fragment in tip of spoon). | | |
| 4 | 3 | 24/21 | 4-6 | 2-2 3-3 | 10.0 | Loose, tan, fine to medium SAND, trace Silt, damp. | | |
| 6 | 4 | 24/15 | 6-8 | 2-2 3-3 | ND | Loose, brown, fine to medium SAND, trace fine to coarse Gravel, moist. | | |
| 8 | 5 | 24/18 | 8-10 | 2-2 3-4 | ND | Loose, brown, fine to medium SAND, trace Silt, moist. | | |
| 10 | 6 | 24/22 | 10-12 | 3-2 2-2 | 3.0 | Loose, brown, fine to medium SAND, trace Silt, moist. | | |
| 12 | 7 | 24/23 | 12-14 | 2-1 2-3 | ND | Loose, brown, fine to medium SAND, trace Silt, moist. | | |
| 14 | 8 | 24/24 | 14-16 | 2-3 3-3 | ND | Loose, tan, fine to medium SAND, trace Silt, moist. Changing at approximately 15.8 feet to: Loose, brown, fine to coarse SAND, trace Silt, moist. | | |
| 16 | 9 | 24/24 | 16-18 | 4-5 8-10 | ND | Medium dense, brown, fine to medium SAND, trace Silt, damp. | | |
| 18 | 10 | 24/22 | 18-20 | 5-10 11-11 | ND | Medium dense, brown, fine to coarse SAND, trace Silt, damp. Changing at approximately 19.7 feet to: Brown, fine to coarse SAND, trace Silt, damp. | | |
| 20 | 11 | 24/20 | 20-22 | 10-9 13-12 | ND | Medium dense, brown, fine to medium SAND, trace Silt, damp. Changing at approximately 21.5 feet to: Medium dense, brown, fine to coarse SAND, trace fine to coarse Gravel, trace Silt, damp with 1.0 inch layer of CLAY and SILT at approximately 21.7 feet. | | |
| 22 | 12 | 24/20 | 22-24 | 4-5 10-9 | ND | Medium dense, tan, fine to medium SAND, | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV5D
**Page:** 2 **of** 3
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 25 | 13 | 24/21 | 24-26 | 5-5<br>9-13 | ND | trace Silt, damp.<br>Medium dense, tan, fine to medium SAND, trace Silt, damp. | SAND | | |
| 26<br>27 | 14 | 24/18 | 26-28 | 3-7<br>7-7 | ND | Loose, brown, fine to coarse SAND, trace Silt, trace fine Gravel, damp. Changing at approximately 27.0 feet to: Medium dense, brown, fine to medium SAND, trace Silt, damp. | | | |
| 28<br>29 | 15 | 24/19 | 28-30 | 2-3<br>4-4 | ND | Loose, brown, fine to coarse SAND, trace fine Gravel, trace Silt, damp. | | | |
| 30<br>31 | 16 | 24/17 | 30-32 | 2-3<br>4-4 | ND | Loose, brown, fine to coarse SAND, trace fine Gravel, trace Silt, damp. | | | Bentonite Grout |
| 32<br>33 | 17 | 24/19 | 32-34 | 2-2<br>2-2 | ND | Loose, brown, fine to coarse SAND, trace fine Gravel, trace Silt, damp. | | 3 | |
| 34<br>35 | 18 | 24/24 | 34-36 | 2-3<br>4-7 | ND<br>ND | Loose, brown, fine to coarse SAND, trace fine Gravel, trace Silt, moist. Changing at approximately 34.2 feet to: Brown, Silty CLAY, little fine to coarse Sand, trace fine Gravel, damp. | 34.2'<br>Silty CLAY | | |
| 36<br>37 | 19 | 24/24 | 36-38 | 1-4<br>3-3 | ND | Medium, brown, CLAY & SILT, some fine Sand, moist. Changing at approximately 36.4 feet to: Brown, fine to medium SAND, trace Silt, wet. Changing at approximately 36.6 feet to: Brown, CLAY & SILT, some fine to medium Sand, moist. | 36'<br>CLAY & SILT | 4 | |
| 38<br>39 | 20 | 24/20 | 38-40 | 1-2<br>5-5 | ND | Medium, brown, CLAY & SILT, some fine to medium Sand, moist. Changing at approximately 39.2 feet to: Medium SAND, trace Silt, damp. | | | |
| 40<br>41 | 21 | 24/24 | 40-42 | 4-9<br>9-11 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | 40'<br>SAND | | |
| 42<br>43 | 22 | 24/22 | 42-44 | 10-13<br>18-19 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | | | |
| 44<br>45 | 23 | 24/24 | 44-46 | 6-10<br>10-13 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | | | |
| 46<br>47 | 24 | 24/20 | 46-48 | 5-12<br>17-22 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | | | |
| 48<br>49 | 25 | 24/22 | 48-50 | 7-16<br>21-22 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | | | |
| 50<br>51 | 26 | 24/24 | 50-52 | 10-11<br>16-21 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | | | |

**REMARKS**

3. Driller noted some clay present in tip of spoon.
4. Groundwater was encountered at approximately 36.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV5D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

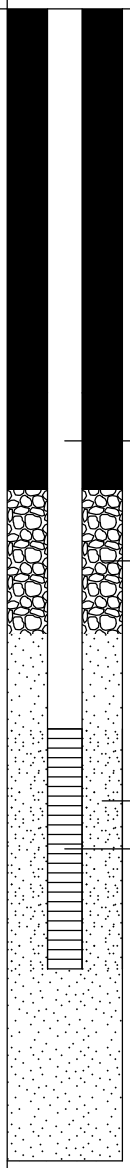
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV5D
**Page:** 3 **of** 3
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 53 | 27 | 24/24 | 52-54 | 4-11 14-14 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | SAND | |
| 54 | 28 | 24/24 | 54-56 | 5-8 13-19 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | | |
| 56 | 29 | 24/24 | 56-58 | 3-5 13-27 | ND | Medium dense, brown, fine SAND, trace Silt, wet. | | |
| 58 | 30 | 24/21 | 58-60 | 9-18 10-16 | ND | Medium dense, brown, fine SAND, trace Silt, wet. Changing at approximately 58.5 feet to: Brown, fine to coarse SAND, some fine Gravel, wet. | | |
| 60 | 31 | 24/24 | 60-62 | 12-18 19-12 | ND | Dense, brown, medium to coarse SAND, some fine Gravel, trace Silt, wet. | | |
| 62 | 32 | 24/15 | 62-64 | 2-3 6-9 | ND | Loose, brown, medium to coarse SAND, some fine Gravel, trace Silt, wet. | | |
| 64 | 33 | 24/18 | 64-66 | 1-2 5-9 | ND | Loose, brown and gray, fine SAND, trace Silt, wet. | | |
| 66 | 34 | 24/12 | 66-68 | 2-4 7-12 | ND | Medium dense, brown and gray, fine SAND, trace Silt, wet. | | |
| 68 | 35 | 24/10 | 68-70 | 1-4 7-10 | ND | Medium dense, brown and gray, fine SAND, trace Silt, wet. | | |
| 70 | 36 | 24/15 | 70-72 | 2-4 7-14 | ND | Medium dense, brown and gray, fine SAND, trace Silt, wet. | | |
| 72 | 37 | 24/24 | 72-74 | 2-5 10-13 | ND | Medium dense, brownish gray, fine SAND, trace Silt, wet. Changing at approximately 73.0 feet to: Brown, CLAY. | 73' CLAY | |
| 74 | 38 | 24/24 | 74-76 | 11-14 26-27 | ND | Hard, brown, CLAY. Changing at approximately 75.5 feet to: Gray, CLAY. | 76' | |
| 76 | | | | | | Bottom of Borehole at 76.0 Feet | | 5 |

**Equipment Installed**




**REMARKS**

5. Monitoring well was installed in borehole upon completion. Well screen set from 67.0 to 72.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV5D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV5S
**Page:** 1 **of** 2
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Joe Workman/Anthony Leonido
**Date Start/Finish:** 3-14-18 / 3-14-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

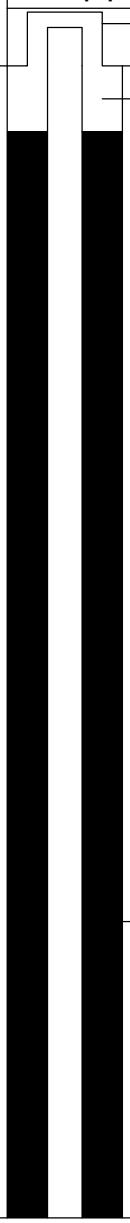
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-WV5D boring log for soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV5S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV5S
**Page:** 2 **of** 2
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 36–64 | | | | | | | | | 2-Inch Riser; Bentonite; Filter Sand; 2-Inch PVC Well Screen |
| 65 | | | | | | Bottom of Borehole at 65.0 Feet | | 1 | |
| 66–75 | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 60.0 to 65.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV5S

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV6D
**Page:** 1 **of** 3
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** Anthony Leonido
**Date Start/Finish:** 3-19-18 / 3-20-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

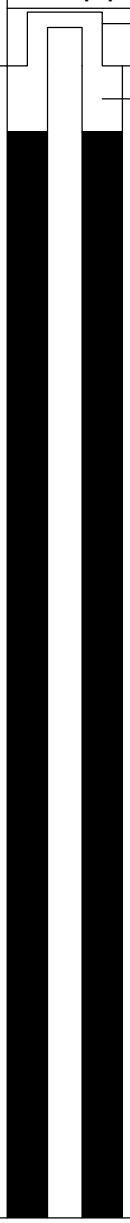
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/8 | 0-2 | 1-1 2-2 | ND | Top 2.0 inches LOAM. Changing to: Loose, brown, fine to medium SAND and SILT, dry. | SAND and SILT | 1 |
| 4 | 2 | 24/12 | 4-6 | 2-2 1-1 | ND | Loose, brown, fine SAND, trace Silt, dry. | 4' SAND and GRAVEL | |
| 9 | 3 | 24/12 | 9-11 | 2-5 7-7 | ND | Medium dense, brown, fine SAND and fine GRAVEL, trace Silt, wet. | | |
| 14 | 4 | 24/15 | 14-16 | 2-5 7-7 | ND | Medium dense, brown, fine to coarse SAND and fine GRAVEL, some Silt, wet. | | 2 |
| 19 | 5 | 24/18 | 19-21 | 2-3 5-16 | ND | Medium, brown, SILT, wet. | 19' SILT | |
| 24 | 6 | 24/18 | 24-26 | 4-10 20-11 | ND | Very stiff, brown, SILT, trace fine Sand, wet. | | |
| 29 | 7 | 24/19 | 29-31 | 11-25 25-32 | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | 29' GLACIAL TILL | |
| 34 | 8 | 24/19 | 34-36 | 4-14 25-34 | ND | Very dense, brown, fine Silty SAND and | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).
2. A groundwater sample was collected from a temporary monitoring with well screen set at approximately 13.0 to 18.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV6D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV6D
**Page:** 2 **of** 3
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | SILT, some Clay, wet (GLACIAL TILL). | GLACIAL TILL | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | 9 | 12/12 | 39-40 | 21-97 | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | Bentonite Grout |
| 48 | | | | | | | | | |
| 49 | 10 | 24/18 | 49-51 | 21-38 44-53 | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | 11 | 24/16 | 54-56 | 20-27 44-50 | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | 12 | 24/17 | 59-61 | 20-24 30-46 | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | 13 | 16/16 | 64-65.3 | 45-32-50/4" | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | 14 | 16/14 | 69-70.3 | 28-46-50/4" | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | 15 | 12/10 | 74-75 | 35-68 | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | | |
| 75 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV6D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

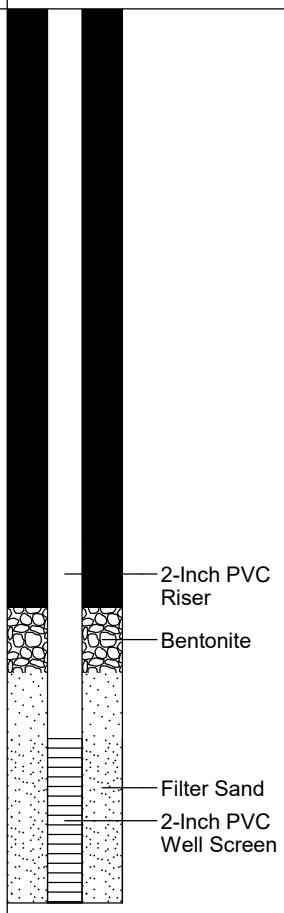
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV6D
**Page:** 3 **of** 3
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | GLACIAL TILL | |
| 77, 78, 79, 80 | 16 | 17/15 | 79-80.4 | 14-25-50/5" | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | |
| 81, 82, 83, 84, 85 | 17 | 6/6 | 84-84.5 | 50-100/0" | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | |
| 86, 87, 88, 89, 90 | 18 | 14/10 | 89-90.2 | 20-40-50/4" | ND | Very dense, brown, SAND and SILT, some Clay, wet (GLACIAL TILL). | | |
| 91, 92, 93, 94, 95 | 19 | 19/17 | 94-95.6 | 40-48 50-40/1" | ND | Very dense, brown, fine SAND, trace Silt, wet. | 94' SAND | |
| 96, 97, 98, 99, 100 | 20 | 24/20 | 99-101 | 2-11 26-33 | ND | Very dense, brown, fine SAND, trace Silt, wet. | | |
| 101, 102, 103, 104, 105 | 21 | 24/18 | 104-106 | 16-16 21-21 | ND | Dense, brown, fine SAND, trace Silt, wet. Changing at approximately 105.0 feet to: Gray, CLAY, wet. | 105' CLAY | 3 |
| 106 | | | | | | Bottom of Borehole at 106.0 Feet | 106' | 4 |
| 107, 108, 109, 110, 111, 112, 113, 114, 115, 116 | | | | | | | | |

**Equipment Installed**




**REMARKS**

3. Groundwater was encountered at approximately 104.0 feet below ground surface.
4. Monitoring well was installed in borehole upon completion. Well screen set from 98.0 to 103.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV6D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV6S
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Burt Graham
**Logged by:** Christopher Melby
**Date Start/Finish:**
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

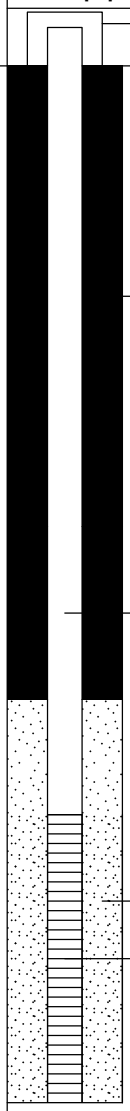
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-WV6D boring log for soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | Bottom of Borehole at 18.0 Feet | | 1 |
| 19 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 13.0 to 18.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV6S

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-7/MW-WV-7D
**Page:** 1 **of** 6
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Zach/Travis
**Logged by:** John Morehouse
**Date Start/Finish:** 10-23-18 / 10-25-18
**Boring Location:**
**GS Elev.:** **Datum:** NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

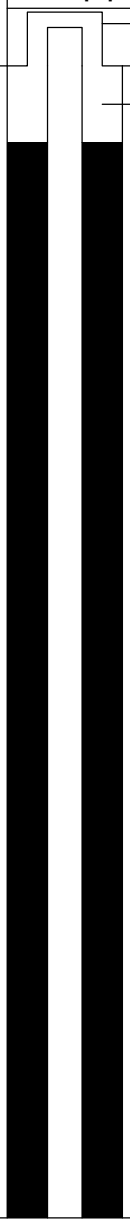
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NM | NM | NM | NM | NM |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/20.4 | 0-2 | 2-2<br>2-2 | ND | Very dark brown, fine grained SAND, some Silt, trace Gravel, moist. Changing at 0.4 feet to: Dark yellowish-brown to yellowish-brown, very fine grained SAND and SILT, moist. Changing at 1.7 feet to: NO RECOVERY. | 0.4' SAND<br>SAND and SILT<br>1.7' | 1 |
| 2 | 2 | 24/15.6 | 2-4 | 1-2<br>1-1 | ND | Yellowish-brown, very fine grained SAND and SILT, moist. Changing at 3.3 feet to: NO RECOVERY. | 2' NO RECOVERY<br>SAND and SILT<br>3.3' | |
| 3 | | | | | | | NO RECOVERY<br>4' | |
| 4 | 3 | 24/19.2 | 4-6 | 1-4<br>3-2 | ND | Yellowish-brown to brown, CLAY & SILT, moist. Changing at 4.6 feet to: Yellowish-brown, fine to medium grained SAND, trace Silt, moist. Changing at 5.6 feet to: NO RECOVERY. | CLAY & SILT<br>4.6'<br>SAND<br>5.6' | |
| 6 | 4 | 24/12 | 6-8 | 1-1<br>1-1 | ND | Yellowish-brown, fine to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 7.0 feet to: NO RECOVERY. | 6' NO RECOVERY<br>SAND<br>7' | |
| 7 | | | | | | | NO RECOVERY<br>8' | |
| 8 | 5 | 24/6 | 8-10 | 1-1<br>1-1 | ND | Yellowish-brown, fine to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 8.5 feet to: NO RECOVERY. | SAND<br>8.5'<br>NO RECOVERY<br>10' | |
| 10 | 6 | 24/12 | 10-12 | 1-1<br>2-2 | ND | Yellowish-brown, fine to coarse grained SAND, little Gravel, trace Silt, moist. Changing at 10.6 feet to: Pale brown to light yellowish-brown, fine SAND, trace Silt, moist. Changing at 11.0 feet to: NO RECOVERY. | SAND<br>11'<br>NO RECOVERY<br>12' | |
| 12 | 7 | 24/16.8 | 12-14 | 2-3<br>3-3 | ND | Pale brown to light yellowish-brown, fine SAND, trace Silt, moist. Changing at 12.7 feet to: Brown, fine to medium SAND, trace Silt, wet. Changing at 13.4 feet to: NO RECOVERY. | SAND<br>13.4'<br>NO RECOVERY<br>14' | 2 |
| 14 | 8 | 24/15.6 | 14-16 | 3-2<br>3-4 | ND | Brown, fine to medium SAND, trace Silt, wet. Changing at 15.3 feet to: NO RECOVERY. | SAND | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).
2. Groundwater was encountered at approximately 12.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-7/MW-WV-7D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-7/MW-WV-7D
**Page:** 2 **of** 6
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 15.3' SAND | | |
| | | | | | | | NO RECOVERY | | |
| 16 | 9 | 24/16.8 | 16-18 | 2-2<br>3-4 | ND | Brown, fine to medium SAND, trace Silt, wet. Changing at 17.4 feet to: NO RECOVERY. | 16' SAND | | |
| 17 | | | | | | | 17.4' | | |
| | | | | | | | NO RECOVERY | | |
| 18 | 10 | 24/19.2 | 18-20 | 0-2<br>3-6 | ND | Brown, fine to medium SAND, trace Silt, wet. Changing at 19.6 feet to: NO RECOVERY. | 18' SAND | | |
| 19 | | | | | | | 19.6' | | |
| | | | | | | | NO RECOVERY | | |
| 20 | 11 | 24/16.8 | 20-22 | 5-6<br>5-11 | ND | Brown, fine to medium SAND, trace Silt, wet. Changing at 21.4 feet to: NO RECOVERY. | 20' SAND | | |
| 21 | | | | | | | 21.4' | | |
| | | | | | | | NO RECOVERY | | |
| 22 | 12 | 24/19.2 | 22-24 | 8-12<br>13-11 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 23.6 feet to: NO RECOVERY. | 22' SAND | | |
| 23 | | | | | | | 23.6' | | |
| | | | | | | | NO RECOVERY | | |
| 24 | 13 | 24/15.6 | 24-26 | 1-1<br>1-1 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 25.3 feet to: NO RECOVERY. | 24' SAND | | |
| 25 | | | | | | | 25.3' | | |
| | | | | | | | NO RECOVERY | | |
| 26 | 14 | 24/14.4 | 26-28 | 1-1<br>2-0 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 27.2 feet to: NO RECOVERY. | 26' SAND | | |
| 27 | | | | | | | 27.2' | | |
| | | | | | | | NO RECOVERY | | |
| 28 | 15 | 24/21.6 | 28-30 | 1-1<br>1-2 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 29.8 feet to: NO RECOVERY. | 28' SAND | | |
| 29 | | | | | | | 29.8' | | |
| | | | | | | | NO RECOVERY | | |
| 30 | 16 | 24/16.8 | 30-32 | 0-0<br>1-1 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 31.4 feet to: NO RECOVERY. | 30' SAND | | |
| 31 | | | | | | | 31.4' | | |
| | | | | | | | NO RECOVERY | | |
| 32 | 17 | 24/20.4 | 32-34 | 0-1<br>3-4 | ND | Brown, fine to medium SAND, trace Silt, | 32' SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-7/MW-WV-7D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-7/MW-WV-7D
**Page:** 3 **of** 6
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 33 | | | | | | trace Gravel, wet. Changing at 33.7 feet to: NO RECOVERY. | SAND | | |
| 34 | 18 | 24/22.8 | 34-36 | 1-2 4-5 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 35.9 feet to: NO RECOVERY. | 33.7' 34' NO RECOVERY SAND | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/10.8 | 36-38 | 1-2 1-4 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 36.9 feet to: NO RECOVERY. | 35.9' 36' NO RECOVERY SAND 36.9' | | |
| 37 | | | | | | | NO RECOVERY | | |
| 38 | 20 | 24/12 | 38-40 | 1-0 4-4 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 38.9 feet to: Brown, GRAVEL, some fine to coarse grained Sand, trace Silt, wet. Changing at 38.9 feet to: NO RECOVERY. | 38' SAND 38.9' | | |
| 39 | | | | | | | 39' GRAVEL NO RECOVERY | | |
| 40 | 21 | 24/15.6 | 40-42 | 1-1 1-2 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 41.3 feet to: NO RECOVERY. | 40' SAND | | |
| 41 | | | | | | | 41.3' NO RECOVERY | | |
| 42 | 22 | 24/15.6 | 42-44 | 1-1 1-1 | ND | Brown, fine to medium SAND, trace Silt, trace Gravel, wet. Changing at 43.3 feet to: NO RECOVERY. | 42' SAND | | |
| 43 | | | | | | | 43.3' NO RECOVERY | | |
| 44 | 23 | 24/6 | 44-46 | 1-1 1-1 | ND | Brown, fine to medium SAND, trace Silt, wet. Changing at 44.3 feet to: Brown, fine to medium SAND, little coarse grained Sand, little Gravel, trace Silt, wet. Changing at 44.5 feet to: NO RECOVERY. | 44' SAND 44.5' | | Bentonite Grout |
| 45 | | | | | | | NO RECOVERY | | |
| 46 | 24 | 24/9.6 | 46-48 | 1-1 3-5 | ND | Brown, fine to medium SAND, little coarse grained Sand, little Gravel, trace Silt, wet. Changing at 46.6 feet to: Brown, GRAVEL and fine to coarse grained Sand, trace Silt, wet. Changing at 46.8 feet to: NO RECOVERY. | 46' SAND 46.6' 46.8' GRAVEL | | |
| 47 | | | | | | | NO RECOVERY | | |
| 48 | 25 | 24/10.8 | 48-50 | 2-3 4-7 | ND | Brown, fine to medium SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 48.9 feet to: NO RECOVERY. | 48' SAND 48.9' | | |
| 49 | | | | | | | NO RECOVERY 50' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-7/MW-WV-7D
**Page:** 4 **of** 6
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 26 | 24/15.6 | 50-52 | 1-1<br>2-2 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet; with thin lenses of yellowish-brown, Silty Clay, moist. Changing at 51.3 feet to: NO RECOVERY. | SAND<br>51.3'<br>NO RECOVERY<br>52' | | |
| 51<br>52 | 27 | 24/15.6 | 52-54 | 0-0<br>2-9 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 53.2 feet to: Brown, GRAVEL and fine to coarse grained Sand, trace Silt, wet. Changing at 53.3 feet to: No RECOVERY. | SAND<br>53.2'<br>53.3' GRAVEL<br>NO RECOVERY<br>54' | | |
| 53<br>54 | 28 | 24/10.8 | 54-56 | 1-1<br>2-3 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Silt, wet. Changing at 54.9 feet to: NO RECOVERY. | SAND<br>54.9'<br>NO RECOVERY<br>56' | | |
| 55<br>56 | 29 | 24/4.8 | 56-58 | 1-0<br>2-4 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 56.3 feet to: Brown, GRAVEL, trace Silt, wet. Changing at 56.4 feet to: NO RECOVERY. | 56.3' SAND<br>56.4' GRAVEL<br>NO RECOVERY<br>58' | | |
| 57<br>58 | 30 | 24/13.2 | 58-60 | 1-2<br>2-3 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 59.1 feet to: NO RECOVERY. | SAND<br>59.1'<br>NO RECOVERY<br>60' | | |
| 59<br>60 | 31 | 24/9.6 | 60-62 | 1-2<br>6-11 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 60.8 feet to: NO RECOVERY. | SAND<br>60.8'<br>NO RECOVERY<br>62' | | |
| 61<br>62 | 32 | 24/18 | 62-64 | 1-4<br>7-11 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 63.5 feet to: NO RECOVERY. | SAND<br>63.5'<br>NO RECOVERY<br>64' | | |
| 63<br>64 | 33 | 24/13.2 | 64-66 | 1-2<br>3-6 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 65.1 feet to: NO RECOVERY. | SAND<br>65.1'<br>NO RECOVERY<br>66' | | |
| 65<br>66 | 34 | 24/16.8 | 66-68 | 2-3<br>5-8 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 67.4 feet to: NO RECOVERY. | SAND<br>67.4' | | |
| 67 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-7/MW-WV-7D
**Page:** 5 **of** 6
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 68 | 35 | 24/21.6 | 68-70 | 1-1<br>2-3 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 69.8 feet to: NO RECOVERY. | 68' NO RECOVERY<br>SAND | | |
| 69 | | | | | | | 69.8' | | |
| 70 | 36 | 24/21.6 | 70-72 | 1-2<br>2-4 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 71.8 feet to: NO RECOVERY. | 70' NO RECOVERY<br>SAND | | |
| 71 | | | | | | | 71.8' | | |
| 72 | 37 | 24/12 | 72-74 | 1-0<br>0-1 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 73.0 feet to: NO RECOVERY. | 72' NO RECOVERY<br>SAND | | |
| 73 | | | | | | | 73'<br>NO RECOVERY | | |
| 74 | 38 | 24/15.6 | 74-76 | 2-3<br>4-9 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 75.3 feet to: NO RECOVERY. | 74'<br>SAND | | |
| 75 | | | | | | | 75.3'<br>NO RECOVERY | | |
| 76 | 39 | 24/19.2 | 76-78 | 1-2<br>5-6 | ND | Brown, fine to medium grained SAND, trace coarse grained Sand, trace Gravel, trace Silt, wet. Changing at 77.2 feet to: Brown, fine to coarse grained SAND, some Gravel, trace Silt, wet. Changing at 77.6 feet to: NO RECOVERY. | 76'<br>SAND | | |
| 77 | | | | | | | 77.6' | | |
| 78 | 40 | 24/12 | 78-80 | 2-1<br>4-5 | ND | Brown, fine to coarse grained SAND, some Gravel, trace Silt, wet. Changing at 79.0 feet to: NO RECOVERY. | 78' NO RECOVERY<br>SAND | | |
| 79 | | | | | | | 79'<br>NO RECOVERY | | |
| 80 | 41 | 24/24 | 80-82 | 2-3<br>5-18 | ND | Brown, fine to medium grained SAND, some Gravel, trace Silt, wet. | 80'<br>SAND | | |
| 81 | | | | | | | | | |
| 82 | 42 | 24/10.8 | 82-84 | 7-11<br>15-27 | ND | Brown, GRAVEL, some fine to coarse grained SAND, wet. Changing at 82.9 feet to: NO RECOVERY. | 82'<br>GRAVEL | | |
| 83 | | | | | | | 82.9'<br>NO RECOVERY | | |
| 84 | 43 | 24/19.2 | 84-86 | 23-27<br>35-25 | ND | Yellowish-brown, GRAVEL, some Silty Sand, wet. Changing at 85.5 feet to: Yellowish-brown, GRAVEL, trace Silt, wet. | 84'<br>GRAVEL | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

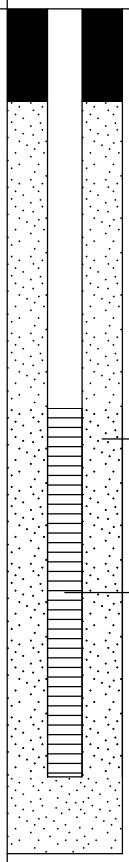
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-7/MW-WV-7D
**Page:** 6 **of** 6
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Changing at 85.6 feet to: NO RECOVERY. | GRAVEL 85.6' | |
| 86 | 44 | 24/8.4 | 86-88 | 6-8 19-29 | ND | Brown, fine to coarse grained SAND, some Gravel, trace Silt, wet. Changing at 86.7 feet to: NO RECOVERY. | 86' NO RECOVERY; SAND 86.7' | |
| 87 | | | | | | | NO RECOVERY 88' | |
| 88 | 45 | 24/24 | 88-90 | 3-4 10-17 | ND | Brown, fine to coarse grained SAND, some Gravel, trace Silt, wet. Changing at 88.8 feet to: Yellowish-brown, GRAVEL, trace Silt, wet. | SAND 88.8' | |
| 89 | | | | | | | GRAVEL | |
| 90 | 46 | 24/7.2 | 90-92 | 14-35 40-50/5" | ND | Yellowish-brown, GRAVEL and fine to coarse grained SAND, little Silt, moist to wet. Changing at 90.6 feet to: NO RECOVERY. | 90.6' NO RECOVERY | |
| 91 | | | | | | | 92' | |
| 92 | 47 | 24/14.4 | 92-94 | 4-8 12-10 | ND | Yellowish-brown, GRAVEL and fine to coarse grained SAND, little Silt, moist to wet. Changing at 93.0 feet to: Very dark grayish-brown, Silty CLAY, moist. Changing at 93.2 feet to: NO RECOVERY. | GRAVEL 93' | |
| 93 | | | | | | | 93.2' CLAY; NO RECOVERY 94' | |
| 94 | 48 | 24/24 | 94-96 | 17-24 26-50 | ND | Very dark grayish-brown, Silty CLAY, moist. | Silty CLAY | |
| 95 | | | | | | | | |
| 96 | | | | | | Bottom of Borehole at 96.0 Feet | 96' | 3 |
| 97 | | | | | | | | |
| 98 | | | | | | | | |
| 99 | | | | | | | | |
| 100 | | | | | | | | |
| 101 | | | | | | | | |
| 102 | | | | | | | | |

**Equipment Installed**




**REMARKS**

3. Monitoring well was installed in borehole upon completion. Well screen set from 90.2 to 95.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-7/MW-WV-7D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-7M
**Page:** 1 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry H.
**Logged by:** John Morehouse
**Date Start/Finish:** 3-18-19 / 3-18-19
**Boring Location:**
**GS Elev.:** **Datum:** Mi State Plane S Zone NAD 83

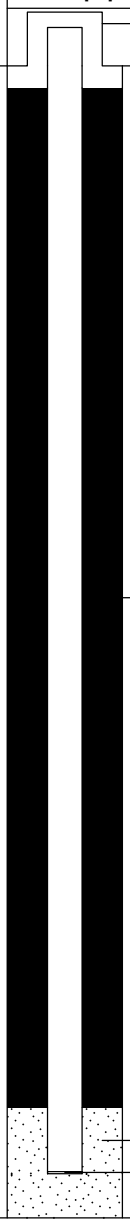
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Direct Push | MacroCore |
| **O.D. / I.D.:** | NA | 2.25" |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-WV7D boring log for soil descriptions. | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-7M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-7M
**Page:** 2 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | Bottom of Borehole at 55.0 Feet | | 1 | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | | | | | | | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 50.0 to 55.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-7M

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV7S
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Zach/Travis
**Logged by:** John Morehouse
**Date Start/Finish:** 10-25-18 / 10-25-18
**Boring Location:**
**GS Elev.:** **Datum:** NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

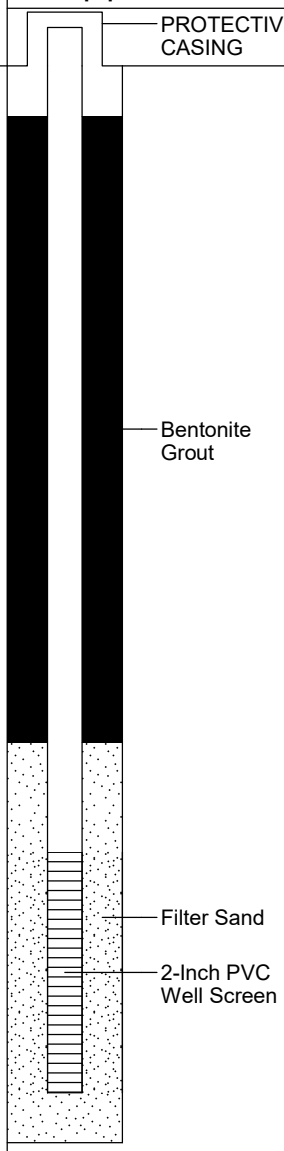
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NM | NM | NM | NM | NM |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–21 | | | | | | See boring log PMW-WV-7/MW-WV-7D for soil descriptions. | | |
| 22 | | | | | | Bottom of Borehole at 21.5 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 15.7 to 20.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV7S

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8D
**Page:** 1 **of** 8
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Burt Graham
**Logged by:** Christopher Melby
**Date Start/Finish:** / 5-9-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

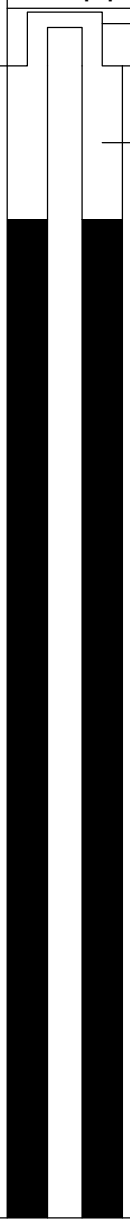
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/21 | 0-2 | 3-4 4-3 | | Dark, yellowish brown, moderately well sorted fine to medium grained SAND, little Silt, slightly cohesive, moist (FILL). Changing at 1.2 feet to: Yellowish brown with occasional dark grayish brown, moderately well sorted fine to medium grained SAND, little Silt, moist. | SAND (FILL) 1.2' SAND | |
| 1 | | | | | | | | |
| 2 | 2 | 24/14 | 2-4 | 1-1 1-3 | | Yellowish brown, well sorted fine to medium grained SAND, trace Silt, moist. | | |
| 3 | | | | | | | | |
| 4 | 3 | 24/17 | 4-6 | 1-2 2-2 | | Yellowish brown, well sorted fine to medium grained SAND, trace Silt, moist. | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/17 | 6-8 | 2-3 2-3 | | Yellowish brown, well sorted fine to medium grained SAND, trace Silt, moist. | | |
| 7 | | | | | | | | |
| 8 | 5 | 24/24 | 8-10 | 3-2 3-4 | | Yellowish brown, well sorted fine to medium grained SAND, trace Silt, moist. | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/19 | 10-12 | 4-4 4-4 | | Yellowish brown, well sorted fine to medium grained SAND, trace Silt, moist. Changing at 11.2 feet to: Brown tho yellowish brown, moderately sorted CLAY & SILT, little Sand, plastic, cohesive, moist. | 11.2' 11.4' CLAY & SILT SAND | |
| 11 | | | | | | | | |
| 12 | 7 | 24/19 | 12-14 | 1-5 5-5 | | Brown to yellowish brown, moderately sorted CLAY & SILT, little Sand, plastic, cohesive, moist. Changing at 13.0 feet to: Brown to yellowish brown, very well sorted SILT, cohesive, non plastic, moist. | 13' 13.2' SILT SAND | |
| 13 | | | | | | | | |
| 14 | 8 | 24/21 | 14-16 | 3-4 5-7 | | Brown to yellowish brown, very well sorted SILT, cohesive, non plastic, moist. Changing at 15.3 feet to: Pale brown to | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8D
**Page:** 2 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | brown, moderately sorted, fine to coarse grained SAND, trace Silt, moist. | SAND | | |
| 16 | 9 | 24/17 | 16-18 | 2-3 7-7 | | Pale brown to light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 17 feet o: Yellowish brown, well sorted, CLAY & SILT, trace Sand, plastic, cohesive, moist. Changing at 17.1 feet o: Pale brown to light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, moist. | 17' 17.1' CLAY & SILT | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/20 | 18-20 | 5-5 6-7 | | Pale brown to light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, moist. | SAND | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/20 | 20-22 | 7-7 8-10 | | Pale brown to light yellowish brown, very well sorted, fine to medium grained SAND, trace Silt, moist. Changing at 21.1 feet to: Pale brown to brown, moderately well sorted, fine to coarse grained SAND, trace Silt, moist. | | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/19 | 22-24 | 4-7 9-12 | | Pale brown to brown, moderately well sorted, fine to coarse grained SAND, trace Silt, moist. Changing at 23.3 feet to: Yellowish brown to brown, moderately sorted, fine to coarse grained SAND, some Gravel, trace Silt, moist to wet. | | 1 | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/14 | 24-26 | 11-12 8-9 | | Yellowish brown to brown, moderately sorted, fine to coarse grained SAND, some Gravel, trace Silt, moist to wet. | | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/20 | 26-28 | 3-4 6-7 | | Brown to dark brown, poorly sorted, medium to coarse grained SAND, some Gravel, trace Silt, wet; grains finer. | | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/19 | 28-30 | 4-4 7-8 | | Brown to dark brown, moderately well sorted, fine to medium SAND, trace Silt, wet. | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/19 | 30-32 | 3-5 5-8 | | Brown to dark brown, moderately well sorted, fine to medium SAND, trace Silt, wet. Changing at 30.5 feet to: Brown, poorly sorted, coarse grained SAND, some Gravel, trace Silt, wet. Changing at 30.6 feet to: Brown to dark brown, moderately well sorted, fine to medium SAND, trace Silt, wet. | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/14 | 32-34 | 6-5 7-6 | | | | | |

**REMARKS**

1. Groundwater was encountered at approximately 23.3 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8D
**Page:** 3 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 33 | | | | | | Brown to dark brown, moderately well sorted, fine to medium SAND, trace Silt, wet. Changing at 33.2 feet to: Brown, well sorted, fine to medium grained SAND, trace Silt, wet. | SAND | | |
| 34 | 18 | 24/18 | 34-36 | 1-2<br>2-5 | | Brown, well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 34.3 feet to: Brown, poorly sorted, fine to coarse grained SAND, little Gravel, trace Silt, wet. Changing at 34.4 feet to: Brown, well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 34.8 feet to: Brown, poorly sorted, fine to coarse grained SAND, little Gravel trace Silt, wet. Changing at 35.5 feet to: Brown, well sorted, fine to medium grained SAND, trace Silt, wet. | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/18 | 36-38 | 5-7<br>9-10 | | | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/21 | 38-40 | 7-7<br>8-9 | | Brown, well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 36.2 feet to: Dark brown, poorly sorted, medium to coarse grained SAND, some Gravel, trace Silt, wet. | | | |
| 39 | | | | | | Dark brown, poorly sorted, medium to coarse grained SAND, some Gravel, trace Silt, wet. | | | |
| 40 | 21 | 24/12 | 40-42 | 6-6<br>6-6 | | Brown, well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 41.0 feet to: Brown, well sorted, fine to medium grained SAND, trace Silt, wet. | | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/2 | 42-44 | 1-1<br>1-1 | | Brown, well sorted, fine to medium grained SAND, trace Silt, wet. | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/14 | 44-46 | 3-5<br>6-9 | | Brown, well sorted, fine to medium grained SAND, trace Silt, wet. Changing at 44.5 feet to: Dark brown, poorly sorted, medium to coarse grained SAND, some Gravel, trace Silt, wet. Changing at 44.6 feet to: Brown, well sorted, fine to medium grained SAND, trace Silt, wet. | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/15 | 46-48 | 2-4<br>6-6 | | Dark yellowish brown, moderately well sorted, fine to coarse grained SAND, litle Gravel, trace Silt, wet; grading coarser. | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/12 | 48-50 | 4-7<br>6-7 | | Dark yellowish brown, moderately well sorted, fine to coarse grained SAND, litle Gravel, trace Silt, wet; grading coarser. | | | |
| 49 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8D
**Page:** 4 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 26 | 24/24 | 50-52 | 3-10<br>15-18 | | Brown, moderately well sorted, fine to coarse grained SAND, little Silt, trace Gravel, trace Silt, wet. Changing at 51.9 feet to: Brown, poorly sorted, fine to coarse SAND, little Silt, trace Gravel, moist to wet. | SAND | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/7 | 52-54 | 3-7-50/4" | | Dark brown, poorly sorted, medium to coarse grained SAND, some Gravel, trace Silt, wet. Changing at 52.6 feet to: Brown, moderately well sorted, fine to coarse SAND, trace Gravel, trace Silt, wet. | | | |
| 53 | | | | | | | | | |
| 54 | 28 | 24/24 | 54-56 | 4-7<br>23-50 | | Brown, moderately well sorted, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 55.2 feet to: Yellowish brown to dark yellowish brown, very well sorted, fine grained SAND, some Silt, bedded, wet. Changing at 55.7 feet to: Brown, very well sorted, SILT, little fine grained Sand, moderately cohesive, wet; grades coarser. Yellowish brown, very well sorted, fine grained SAND and Silt, moderately cohesive, wet. | | | |
| 55 | | | | | | | 55.7' | | |
| 56 | 29 | 24/14 | 56-58 | 4-17-50/6" | | | 56' SILT<br>SAND | | |
| 57 | | | | | | | | | Bentonite Grout |
| 58 | 30 | 24/23 | 58-60 | 16-27<br>33-45 | | Yellowish brown, very well sorted, fine grained SAND and Silt, moderately cohesive, wet. Changing at 58.5 feet to: Yellowish brown, very well sorted, SILT, moderately cohesive, non plastic, wet. Changing at 58.6 feet to: Yellowish brown, very well sorted, fine grained SAND and Silt, moderately cohesive, wet. Yellowish brown, very well sorted, fine grained SAND and Silt, moderately cohesive, wet. | 58.5' | | |
| 59 | | | | | | | 58.6' SILT<br>SAND | | |
| 60 | 31 | 24/9 | 60-62 | 5-8<br>38-50/3" | | | | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/13 | 62-64 | 3-14<br>42-41 | | Yellowish brown, very well sorted, fine grained SAND and Silt, moderately cohesive, wet. | | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/11 | 64-66 | 38-50/4.5" | | Yellowish brown, very well sorted, fine grained SAND and Silt, moderately cohesive, wet. Changing at 64.5 feet to: Light yellowish brown, very well sorted, SILT, moderately cohesive, non plastic, wet. Changing at 64.7 feet to: Light yellowish brown, well sorted, SILT & CLAY, slightly plastic, moderately cohesive, moist. Changing at 64.9 feet to: Yellowish brown, very well sorted, fine grained SAND and Silt, moderately cohesive, wet. | 64.5' | | |
| 65 | | | | | | | 64.7' SILT<br>64.9' SILT & CLAY<br>SAND | | |
| 66 | 34 | 24/9 | 66-68 | 4-15<br>34-40 | | | 66'<br>SILT<br>66.5'<br>SAND | | |
| 67 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8D
**Page:** 5 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 68 | 35 | 24/11 | 68-70 | 8-14<br>44-50/4" | | Grayish brown very well sorted, SILT, trace fine grained Sand, cohesive, non plastic, bedded, moist. Changing at 66.5 feet to: Grayish brown, very well sorted, fine grained SAND, trace Silt, moist. | SAND | | |
| 69 | | | | | | Grayish brown, very well sorted, fine grained SAND, trace Silt, moist. Changing at 68.3 feet to: Grayish brown, moderately sorted, fine to medium SAND, some Silt, trace Gravel, slightly cohesive, moist to wet. | | | |
| 70 | 36 | 24/9 | 70-72 | 49-50/4" | | Grayish brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, slightly plastic, cohesive, moist. | 70'<br>SILT & CLAY | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/24 | 72-74 | 8-10<br>20-29 | | Dark grayish brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. | 72'<br>CLAY & SILT | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/24 | 74-76 | 13-24<br>35-45 | | Hard, brown, Clayey SILT, some medium Sand, trace Gravel (embedded in Clayey SILT), wet. | 74'<br>Clayey SILT | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | 39 | 24/24 | 79-81 | 6-13<br>27-41 | | Hard, brown, Clayey SILT, some medium Sand (embedded in Clayey Silt), wet. | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | 40 | 24/18 | 84-86 | 2-2<br>5-6 | | Medium stiff, brown, Clayey SILT, some medium Sand, wet. | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8D
**Page:** 6 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clayey SILT | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | 41 | 24/24 | 89-91 | 9-16 44-45 | | Hard, brown, Clayey SILT, some medium Sand, wet. | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | 42 | 24/24 | 94-96 | 8-16 30-55 | | Hard, brown, Clayey SILT, some medium Sand, wet. | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | 43 | 24/24 | 99-101 | 8-19 34-42 | | Hard, brown, Clayey SILT, some medium Sand, wet. | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8D
**Page:** 7 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 103 | | | | | | | Clayey SILT | | |
| 104 | 44 | 24/24 | 104-106 | 6-14<br>20-20 | | Hard, brown, Clayey SILT, some medium to coarse Sand, wet. Changing at 105.0 feet to: Brown, fine to medium SAND, little Silt, wet. | | | |
| 105 | | | | | | | 105'<br>SAND | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | 45 | 24/20 | 109-111 | 7-10<br>15-37 | | Medium dense, brown, fine to coarse SAND, little Silt, wet. | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | 46 | 22/22 | 114-115.8 | 3-5<br>24-50/4" | | Medium dense, brown, fine to medium SAND, trace Silt, wet. | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | Filter Sand |
| 117 | | | | | | | | | 2-Inch PVC Well Screen |
| 118 | | | | | | | | | |
| 119 | 47 | 11/11 | 119-119.9 | 6-63/5" | | Very dense, brown, fine to medium SAND, trace Silt, wet. Changing at 119.6 feet to: Very dense, gray, fine to medium SAND and | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8D
**Page:** 8 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Silt, wet. | SAND | | |
| 121 | 48 | 6/6 | 121-121.5 | 74 | | Very dense, gray, fine to medium SAND and Silt, wet. | | 2 | |
| 122 | | | | | | | | | |
| 123 | | | | | | | | | |
| 124 | 49 | 9/9 | 124-124.8 | 35-50/3" | | Very dense, gray, fine to medium SAND and Silt. | | | |
| 125 | | | | | | | | | |
| 126 | | | | | | | | | |
| 127 | | | | | | | | | |
| 128 | | | | | | | | | |
| 129 | 50 | 16/16 | 129-130.3 | 17-42-50/4" | | Hard, gray, SILT & CLAY, some fine to medium Sand, wet. | 129' SILT & CLAY | | |
| 130 | | | | | | Bottom of Borehole at 130.3 Feet | 130.3' | 3 | |
| 131 | | | | | | | | | |
| 132 | | | | | | | | | |
| 133 | | | | | | | | | |
| 134 | | | | | | | | | |
| 135 | | | | | | | | | |
| 136 | | | | | | | | | |
| 137 | | | | | | | | | |

**REMARKS**

2. Auger advancement slows at 120.0 fee below ground surface. Harder material. Collected in spoon.
3. Monitoring well was installed in borehole upon completion. Well screen set from 115.0 to 120.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8M
**Page:** 1 **of** 2
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Burt Graham
**Logged by:** Christopher Melby
**Date Start/Finish:** 5-9-18 / 5-10-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

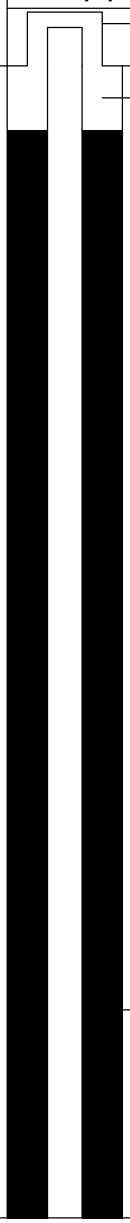
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-WV8D boring log for soil descriptions from 0.0 to 63.0 feet. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8M

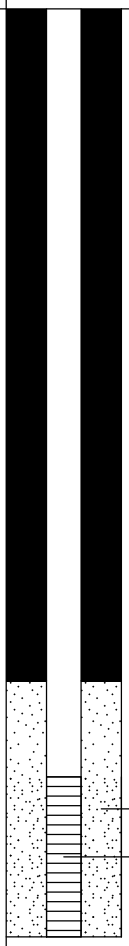
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8M
**Page:** 2 **of** 2
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 37–62 | | | | | | | | |
| 63–64 | S-1 | 24/24 | 63-65 | 15-23<br>36-51 | | Very dense, brown, fine to medium SAND, trace Silt, wet. | SAND<br>65' | |
| 65 | | | | | | Bottom of Borehole at 65.0 Feet | | 1 |
| 66–77 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 60.0 to 65.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8M

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV8S
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Burt Graham
**Logged by:** Christopher Melby
**Date Start/Finish:** 5-9-18 / 5-9-18
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

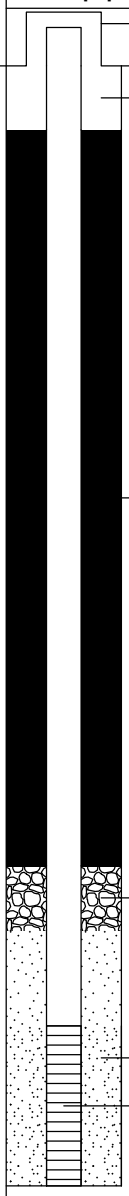
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–35 | | | | | | See MW-WV8D boring log for soil descriptions from 0.0 to 33.0 feet. | | |
| 33–34 | S-1 | 24/12 | 33-35 | 2-3<br>4-6 | | Loose, brown and gray, fine to coarse SAND, trace Silt. | SAND<br>35' | |
| 35 | | | | | | Bottom of Borehole at 35.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 30.0 to 35.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV8S

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV9D
**Page:** 1 **of** 8
**File No.:** 16.0062677.81
**Check:**

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Zach/Travis
**Logged by:** John Morehouse
**Date Start/Finish:**
**Boring Location:**
**GS Elev.:** **Datum:**

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

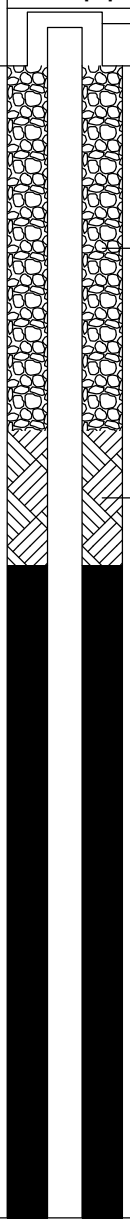
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/21 | 0-2 | 2-2<br>2-3 | | Very dark grayish brown, moderately well sorted, SILT, some fine to medium grained Sand, trace Gravel, moist. | SILT | |
| 1 | | | | | | | | |
| 2 | 2 | 24/19 | 2-4 | 2-1<br>1-1 | | Dark yellowish brown, poorly sorted, fine grained SAND, some Silt, trace Clay, slightly plastic, moderately cohesive, moist. | 2'<br>SAND | |
| 3 | | | | | | | | |
| 4 | 3 | 24/20 | 4-6 | 3-2<br>2-3 | | Yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist. | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/17 | 6-8 | 2-2<br>2-3 | | Yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist. | | |
| 7 | | | | | | | | |
| 8 | 5 | 24/18 | 8-10 | 2-3<br>2-2 | | Yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist. | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/23 | 10-12 | 2-2<br>3-3 | | Yellowish brown, well sorted, fine to medium grained SAND, trace Silt, moist. | | |
| 11 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV9D
**Page:** 2 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24/17 | 12-14 | 3-4<br>5-4 | | Pale brown, well sorted, fine to medium grained SAND, bedded, moist. | SAND | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/19 | 14-16 | 3-4<br>5-5 | | Pale brown, well sorted, fine to medium grained SAND, bedded, moist. | | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/23 | 16-18 | 3-7<br>7-7 | | Pale brown, well sorted, fine to medium grained SAND, bedded, moist. | | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/17 | 18-20 | 3-4<br>6-7 | | Pale brown, well sorted, fine to medium grained SAND, bedded, moist. | | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/23 | 20-22 | 3-5<br>5-7 | | Pale brown, well sorted, fine to medium grained SAND, bedded, moist. Changing at 21.2 feet to: Yellowish brown, very well sorted, SILT & CLAY, moderately plastic, moderately cohesive, moist. Changing at 21.3 feet to: Pale brown grading to very pale brown, well sorted, fine to medium grained SAND, bedded, moist. | 21.2'<br>21.3' SILT & CLAY<br>SAND | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/17 | 22-24 | 8-13<br>17-22 | | Pale brown grading to very pale brown, well sorted, fine to medium grained SAND, bedded, moist. | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/23 | 24-26 | 15-20<br>18-21 | | Pale brown grading to very pale brown, well sorted, fine to medium grained SAND, bedded, moist. Changing at 25.1 feet to: Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 25 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV9D
**Page:** 3 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/23 | 26-28 | 6-11 14-17 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | SAND | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/22 | 28-30 | 10-18 17-18 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/18 | 30-32 | 11-16 19-22 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/23 | 32-34 | 11-14 15-16 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. Changing at 32.6 feet to: Yellowish brown to brown, very well sorted, fine grained SAND, trace Silt, moist to wet. Changing at 33.2 feet to: Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/24 | 34-36 | 13-17 21-25 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/24 | 36-38 | 8-12 22-24 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/23 | 38-40 | 17-18 23-25 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | 38' CLAY & SILT | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV9D
**Page:** 4 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24/19 | 40-42 | 6-13<br>21-28 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | CLAY & SILT | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/19 | 42-44 | 5-11<br>17-20 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/22 | 44-46 | 7-15<br>20-23 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/20 | 46-48 | 5-6<br>9-13 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, some Silt, trace Clay, trace Gravel, slightly to moderately plastic, cohesive, moist. Changing at 46.3 feet to: Brown, well sorted, fine to medium grained SAND, trace Silt, moist to wet. Changing at 46.9 feet to: Dark grayish brown, moderately sorted, CLAY & SILT, some Sand, trace Gravel, slightly to moderately plastic, cohesive, moist. | 46.3'<br>SAND<br>46.9'<br>CLAY & SILT | | |
| 47 | | | | | | | | | Bentonite Grout |
| 48 | 25 | 24/24 | 48-50 | 8-16<br>24-30 | | Dark grayish brown, moderately sorted, CLAY & SILT, some Sand, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24/11 | 50-52 | 5-11<br>19-25 | | Dark grayish brown, moderately sorted, CLAY & SILT, some Sand, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/24 | 52-54 | 7-17<br>23-32 | | Dark grayish brown, moderately sorted, CLAY & SILT, some Sand, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV9D
**Page:** 5 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 28 | 24/24 | 54-56 | 7-16<br>25-26 | | Dark grayish brown, moderately sorted, CLAY & SILT, some Sand, trace Gravel, slightly to moderately plastic, cohesive, moist. Changing at 55.5 feet to: Brown, poorly sorted, fine to coarse grained SAND, little Gravel, little Silt, moist to wet. Changing at 55.6 feet to: Dark grayish brown, moderately sorted, CLAY & SILT, some Sand, trace Gravel, slightly to moderately plastic, cohesive, moist. | CLAY & SILT<br>55.5'<br>55.6' SAND<br>CLAY & SILT | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/24 | 56-58 | 5-13<br>19-25 | | Dark grayish brown, moderately sorted, CLAY & SILT, some Sand, trace Gravel, slightly to moderately plastic, cohesive, moist. | | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24/24 | 58-60 | 9-15<br>31-43 | | Dark grayish brown, moderately sorted, CLAY & SILT, some Sand, trace Gravel, slightly to moderately plastic, cohesive, moist. Changing at 59.5 feet to: Dark yellowish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 59.7 feet to: Yellowish brown, well sorted, SILT, trace Sand, non plastic, moderately cohesive, moist. | 59.7'<br>60' SILT<br>CLAY & SILT | | |
| 59 | | | | | | | | | |
| 60 | 31 | 24/24 | 60-62 | 11-15-50/5" | | Dark grayish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 60.6 feet to: Brown, poorly sorted, fine to medium grained SAND, little Silt, trace Clay, soft, moist to wet. Changing at 60.7 feet to: Dark yellowish brown grading to dark grayish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. | 60.6'<br>60.7' SAND<br>CLAY & SILT | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/24 | 62-64 | 5-13<br>23-22 | | Dark yellowish brown grading to dark grayish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 62.4 feet to: Dark yellowish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 62.7 feet to: Brown, poorly sorted, fine to medium grained, SAND, little Silt, trace Clay, slightly plastic, moist to wet. Changing at 62.8 feet to: Dark yellowish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 63.5 feet to: Dark grayish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, grades softer, moist. | 62.7'<br>62.8' SAND<br>CLAY & SILT | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/24 | 64-66 | 8-16<br>30-45 | | | | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/24 | 66-68 | 13-23<br>32-35 | | Dark grayish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, grades softer, moist. | | | |
| 67 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV9D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV9D
**Page:** 6 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 35 | 24/24 | 68-70 | 11-18<br>24-32 | | Dark grayish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, grades softer, moist. | CLAY & SILT | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/24 | 70-72 | 12-10<br>11-18 | | Dark grayish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, grades softer, moist. | | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/24 | 72-74 | 12-14<br>17-20 | | Dark grayish brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, grades softer, moist. | | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/11 | 74-76 | 0-2<br>3-5 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, little Silt trace Gravel, moist to wet. | 74'<br>SAND | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/15 | 76-78 | 8-15<br>23-26 | | Yellowish brown, moderately sorted, fine to coarse grained SAND, little Silt trace Gravel, moist to wet. Changing at 76.9 feet to: Yellowish brown, moderately well sorted, fine to medium grained SAND, little Silt, moderately cohesisve, moist to wet. | | 1 | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/15 | 78-80 | 8-20<br>29-37 | | Yellowish brown, moderately well sorted, fine to medium grained SAND, little Silt, moderately cohesisve, moist to wet. | | | |
| 79 | | | | | | | | | |
| 80 | 41 | 24/9 | 80-82 | 14-33-50/3" | | Yellowish brown, moderately well sorted, fine to medium grained SAND, little Silt, moderately cohesisve, moist to wet. | | | |
| 81 | | | | | | | | | |

**REMARKS**

1. Groundwater was encountered at approximately 76.9 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV9D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV9D
**Page:** 7 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 42 | 24/3 | 82-84 | 21-44-50/3" | | Yellowish brown, moderately well sorted, fine to medium grained SAND, little Silt, moderately cohesisve, moist to wet. | SAND | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/8 | 84-86 | 50/5" | | Yellowish brown, poorly sorted, fine to medium grained SAND, little Silt, trace Gravel, trace Clay, non to slighty plastic, slightly cohesive, moist to wet. | | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/7 | 86-88 | 12-35-50/6" | | Yellowish brown, poorly sorted, fine to medium grained SAND, little Silt, trace Gravel, trace Clay, non to slighty plastic, slightly cohesive, moist to wet. | | | |
| 87 | | | | | | | | | |
| 88 | 47 | 24/7 | 88-90 | 21-50/3" | | Light yellowish brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, wet. | | | |
| 89 | | | | | | | | | |
| 90 | 48 | 24/2 | 90-92 | 13-34-50/3" | | Yellowish brown, poorly sorted, fine to medium grained SAND, little Silt, trace Gravel, trace Clay, non to slighty plastic, slightly cohesive, moist to wet. | | | |
| 91 | | | | | | | | | |
| 92 | 49 | 24/17 | 92-94 | 5-14<br>30-50/3" | | Yellowish brown, poorly sorted, fine to medium grained SAND, little Silt, trace Gravel, trace Clay, non to slighty plastic, slightly cohesive, moist to wet. | | | |
| 93 | | | | | | | | | Filter Sand |
| 94 | 50 | 24/13 | 94-96 | 35-34<br>32-30 | | Light yellowish brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, occasional very thin Silt seams, wet. | | | |
| 95 | | | | | | | | | 2-Inch PVC Well Screen |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV9D

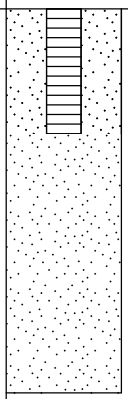
BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV9D
**Page:** 8 **of** 8
**File No.:** 16.0062677.81
**Check:**

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 51 | 24/24 | 96-98 | 7-12<br>9-11 | | Light yellowish brown to pale brown, very well sorted, fine to medium grained SAND, trace Silt, occasional very thin Silt seams, wet. Changing at 96.6 feet to: Dark grayish brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, slightly plastic, moderately cohesive, moist. Changing at 96.8 feet to: Light yellowish brown to pale brown, very well sorted, fine to medium grained SANd, trace Silt, wet. Changing at 97.3 feet to: Dark grayish brown, poorly sorted, medium to coarse grained SAND, trace Gravel, trace Silt, wet. Changing at 97.8 feet to: Dark grayish brown, poorly sorted, medium to coarse grained SAND, trace Gravel, moderately plastic, cohesive, hard, moist. | SAND<br>96.6'<br>96.8 SILT & CLAY<br>SAND<br>97.8'<br>SILT & CLAY<br>100' | | |
| 97 | | | | | | | | | |
| 98 | 52 | 24/15 | 98-100 | 8-16<br>21-28 | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | Dark grayish brown, poorly sorted, medium to coarse grained SAND, trace Gravel, moderately plastic, cohesive, hard, moist.<br>Bottom of Borehole at 100.0 Feet | | 2 | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | | | | | | | | | |



**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from 92.3 to 97.3 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV9D

BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 8/1/18

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10D
**Page:** 1 **of** 4
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry H.
**Logged by:** John Morehouse
**Date Start/Finish:** 3-5-19 / 3-13-19
**Boring Location:**
**GS Elev.:** **Datum:** Mi State Plane S Zone NAD 83

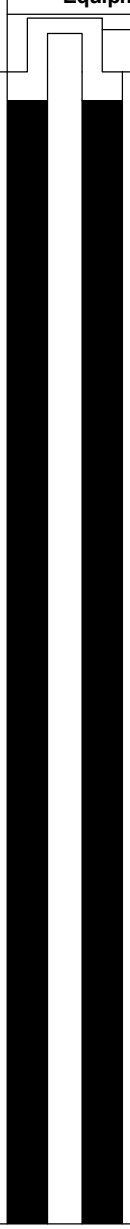
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-WV-10S for soil descriptions from 0.0 to 78.8 feet. | BLIND DRILL | 1 |

**Equipment Installed**




**REMARKS**

1. Blind drilled from 0.0 to 78.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10D
**Page:** 2 **of** 4
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 41–86 | | | | | | | BLIND DRILL | | |
| 78 | 1 | 24/22 | 78-80 | 11-24 36-50 | 2.3 ppmv | Gray, CLAY, moist. Changing at 78.2 feet to: Very dense, brown, fine to coarse SAND, moist. | 78' 78.2' CLAY SAND | | |
| 80 | 2 | 24/24 | 80-82 | 12-48-50 | 1.7 ppmv | Very dense, fine to coarse SAND, moist. Changing at 80.2 feet to: Hard, gray, CLAY, wet. | 80.2' CLAY | | Bentonite/Grout |
| 82 | 3 | 24/24 | 82-84 | 42-50 | 0.1 ppmv | Hard, gray, Clayey SILT, wet. Changin gat 83.8 feet to: Very dense, gray, fine to coarse SAND, wet. | 82' Clayey SILT | | |
| 84 | 4 | 24/12 | 84-86 | 19-50 | 1.7 ppmv | Hard, gray, Clayey SILT, trace fine to | 83.8' 84' SAND Clayey SILT 86' CLAY | | |

**REMARKS**

Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-10D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10D
**Page:** 3 **of** 4
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 87 | 5 | 24/24 | 86-88 | 3-10 | 2.3 ppmv | coarse Sand, wet. | CLAY | | |
| 88 | 6 | 24/24 | 88-90 | 28-45 19-29 38-50 | 1.5 ppmv | Hard, gray, CLAY, trace Silt, trace Rock fragments, moist. Changing at 86.2 feet to: Gray, SAND, moist. Changing at 87.2 feet to: Stiff, gray, Silty CLAY, wet. | 88' Clayey SILT | | |
| 89 | | | | | | | | | |
| 90 | 7 | 24/24 | 90-92 | 10-18 32-41 | 2.3 ppmv | Hard, gray, Clayey SILT, trace fine to coarse Sand, moist. | 90' Silty CLAY | | |
| 91 | | | | | | | | | |
| 92 | 8 | 24/24 | 92-94 | 3-8 21-27 | 2.5 ppmv | Hard, gray, Silty CLAY, little fine to coarse Sand, moist. | | | |
| 93 | | | | | | | | | |
| 94 | 9 | 24/24 | 94-96 | 3-8 21-27 | 1.9 ppmv | Hard, gray, Silty CLAY, trace Rock fragments, wet. | | | |
| 95 | | | | | | | | | |
| 96 | 10 | 24/24 | 96-98 | 20-21 26-38 | 0.9 ppmv | Hard, gray, Silty CLAY, trace Rock fragments, wet. | | | |
| 97 | | | | | | | | | |
| 98 | 11 | 24/24 | 98-100 | 27-32 40-80 | 7.1 ppmv | Hard, gray, Silty CLAY, trace fine to coarse Sand, wet. | | | |
| 99 | | | | | | Hard, gray, Silty CLAY, wet. | | | |
| 100 | 12 | 24/24 | 100-102 | 1-2 11-22 | 1.6 ppmv | Hard, gray, Silty CLAY, trace fine to coarse Sand, wet. | | | |
| 101 | | | | | | | | | |
| 102 | 13 | 24/12 | 102-104 | 5-40 48-50 | 0.9 ppmv | Hard, gray, Silty CLAY, wet. | | | |
| 103 | | | | | | | | | |
| 104 | 14 | 24/24 | 104-106 | 5-19 18-26 | 1.7 ppmv | Hard, gray, Silty CLAY, trace Gravel, wet. | | | |
| 105 | | | | | | | | | |
| 106 | 15 | 24/24 | 106-108 | 2-2 18-24 | 1.6 ppmv | Hard, gray, Silty CLAY, trace fine to coarse Sand, wet. | | | |
| 107 | | | | | | | | | |
| 108 | 16 | 24/24 | 108-110 | 6-13 25-46 | 1.8 ppmv | Hard, gray, Silty CLAY, moist. | | | |
| 109 | | | | | | | | | |
| 110 | 17 | 24/20 | 110-112 | 7-28-50 | 0.6 ppmv | Hard, gray, Silty CLAY, wet. | | | |
| 111 | | | | | | | | | |
| 112 | 18 | 24/24 | 112-114 | 3-19 50-21 | 1.4 ppmv | Hard, gray, Silty CLAY, moist. Changing at 113.7 feet to: Very loose, fine to coarse SAND, trace Gravel, moist. | 114' SAND | | |
| 113 | | | | | | | | | |
| 114 | 19 | 24/24 | 114-116 | 2-4 10-16 | 2.2 ppmv | Medium dense, gray, fine to coarse SAND, trace Silt, wet. | | | |
| 115 | | | | | | | | | |
| 116 | 20 | 24/10 | 116-118 | 6-27-50/4 | 0.7 ppmv | Medium dense, gray, fine to coarse SAND, trace Silt, wet. Changing at 116.5 feet to: Gray, fine to coarse Clayey SAND, some Gravel, wet. | 116.5' Clayey SAND | | |
| 117 | | | | | | | | | |
| 118 | 21 | 24/23 | 118-120 | 5-26 29-32 | 0.5 ppmv | | 118' SAND | | |
| 119 | | | | | | Dense, gray, SAND, wet. Changing at 119.8 feet to: Hard, gray, CLAY, little fine to coarse Sand, trace Gravel, moist. | 119.8' | | |
| 120 | 22 | 24/10 | 120-122 | 24-50 | 0.4 ppmv | | 120' CLAY Silty CLAY | | |
| 121 | | | | | | | | | |
| 122 | 23 | 24/24 | 122-124 | 6-27-50 | 0.4 ppmv | Hard, gray, Silty CLAY, trace Rock fragments, wet. | | | |
| 123 | | | | | | Hard, gray, Silty CLAY, trace Gravel, wet. | | | |
| 124 | 24 | 24/24 | 124-126 | 23-50/6" | 0.6 ppmv | Medium dense, gray and brown, SAND, wet. Changing at 123.8 feet to: Hard, gray, Silty CLAY, trace Gravel, wet. | 124' SAND | | |
| 125 | | | | | | | | | |
| 126 | 25 | 24/24 | 126-128 | 9-30-50/6 | 0.4 ppmv | Dense, gray and brown, SAND, trace Gravel, wet. Changing at 127.5 feet to: Hard, gray, Silty CLAY, trace fine to coarse Sand, wet. | | | |
| 127 | | | | | | | | | |
| 128 | 26 | 24/4 | 128-130 | 4-40-50/6 | 0.4 ppmv | | | | |
| 129 | | | | | | | | | |
| 130 | 27 | 24/24 | 130-132 | 13-31-52/6 | 0.4 ppmv | Gray and brown, fine to coarse SAND, wet. Hard, gray, Silty CLAY, trace fine to coarse SAND, wet. | 130' Silty CLAY | | |
| 131 | | | | | | | | | |
| 132 | 28 | 24/24 | 132-134 | 11-26 | 0.4 ppmv | Hard, gray, Silty CLAY, trace fine to coarse | | | |
| 133 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-10D

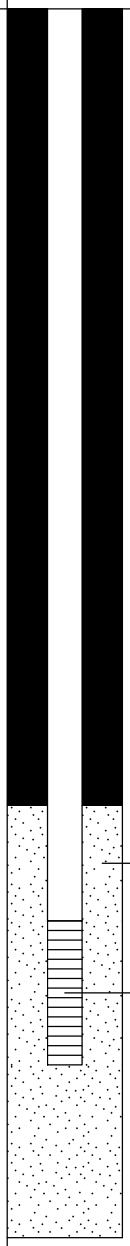
**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10D
**Page:** 4 **of** 4
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 134–135 | 29 | 24/24 | 134-136 | 29-50/6" 16-34-50/6" | 0.3 ppmv | SAND, wet. Hard, gray, Silty CLAY, trace fine to coarse SAND, wet. | Silty CLAY | |
| 136–137 | 30 | 24/14 | 136-138 | 5-17 28-33 | 1.5 ppmv | Very stiff, Clayey SILT, little fine to coarse Sand, wet. Changing at 137.8 feet to: Hard, gray, Silty CLAY, wet. | 136' Clayey SILT | |
| 138–139 | 31 | 24/22 | 138-140 | 14-50/6" | 1.1 ppmv | Hard, gray, Silty CLAY, wet with Rock fragments at top of spoon. | 138' Silty CLAY | |
| 140–141 | 32 | 24/24 | 140-142 | 8-20 25-34 | 1.2 ppmv | Hard, gray, Silty CLAY, wet. | | |
| 142–143 | 33 | 24/24 | 142-144 | 22-27 40-45 | 2.0 ppmv | Hard, gray, Silty CLAY, wet with fine Sand at bottom of spoon. | | |
| 144–145 | 34 | 24/24 | 144-146 | 9-22 44-50/3" | 0.8 ppmv | Hard, gray, Silty CLAY, little Gravel, wet with 2-inch of Gravel at top of spoon. | | |
| 146–147 | 35 | 24/24 | 146-148 | 9-38-50/3" | 1.6 ppmv | Hard, gray, Silty CLAY, wet. | | |
| 148–149 | 36 | 24/24 | 148-150 | 2-22 29-32 | 1.2 ppmv | Hard, gray, Silty CLAY, wet. | | |
| 150–151 | 37 | 24/24 | 150-152 | 2-7 19-31 | 2.3 ppmv | Very stiff, gray, Silty CLAY, wet. | | |
| 152–153 | 38 | 24/24 | 152-154 | 18-30 44-50/6" | 1.9 ppmv | Hard, gray, Silty CLAY, trace Gravel, wet. | 154' SAND | |
| 154–155 | 39 | 24/24 | 154-156 | 8-14 45-50/6" | 1.5 ppmv | Very dense, gray, Clayey fine to coarse SAND, some Gravel, wet. | | |
| 156–157 | 40 | 24/18 | 156-158 | 22-50/4" | 1.5 ppmv | Very dense, gray, Clayey fine to coarse SAND, some Gravel, wet. | 158' SAND and GRAVEL | |
| 158–159 | 41 | 24/15 | 158-160 | 24-50/3" | 1.0 ppmv | Very dense, gray, Clayey fine to coarse SAND and GRAVEL, wet. | | 2 |
| 160–161 | 42 | 24/24 | 160-162 | 50/4" | 0.4 ppmv | Very dense, gray, Clayey fine to coarse SAND and GRAVEL, wet. | | |
| 162–163 | 43 | 24/24 | 162-164 | 14-50/4" | 0.2 ppmv | Very dense, gray, Clayey fine to coarse SAND and GRAVEL, wet. | 164' CLAY | |
| 164–165 | 44 | 24/10 | 164-166 | 50/3" | 0.4 ppmv | Hard, Silty CLAY, some Gravel, some fine to coarse Sand, wet. | 166' SAND | |
| 166–167 | 45 | 24/12 | 166-168 | 50/6" | 0.9 ppmv | Very dense, red, Clayey fine to coarse SAND, some Gravel, wet. | | |
| 168–169 | 46 | 24/12 | 168-170 | 50 | 0.7 ppmv | Very dense, red, Clayey fine to coarse SAND, some Gravel, trace Shells, wet. | 170' NO RECOVERY | |
| 170–171 | 47 | 24/0 | 170-172 | 50/3" | NA | NO RECOVERY. | | 3 |
| 172–173 | 48 | 24/0 | 172-174 | 50/3" | NA | NO RECOVERY. | | |
| 174–175 | 49 | 24/0 | 174-176 | 50/3" | NA | NO RECOVERY. | 176' | |
| 176–177 | | | | | | Bottom of Borehole at 176.0 Feet | | 4 |

**Equipment Installed**




**REMARKS**

2. Temporary well installed from 158.0 to 168.0 feet below ground surface. Well screen interval from 163.0 to 168.0 feet below ground surface. Purged 80.0 gallons of water.
3. Likely ecountered sandstone bedrock at 170.0 feet below ground surface with a well screen set from 165.0 to 170.0 feet below ground surface.
4. Monitoring well was installed in borehole upon completion. Well screen set from approximately 165.0 to 170.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-10D

BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10M
**Page:** 1 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry H.
**Logged by:** John Morehouse
**Date Start/Finish:** 3-5-19 / 3-13-19
**Boring Location:**
**GS Elev.:** **Datum:** MI State Plane S Zone NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

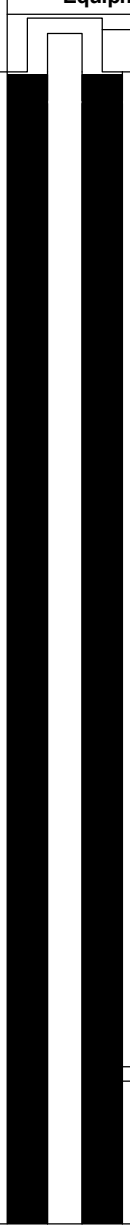
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/12 | 0-2 | 3-1 1-4 | ND | Very loose, dark brown, TOPSOIL. Changing at 0.5 feet to: Brown, fine SAND, some Silt, trace Gravel, dry. | 0.5' TOPSOIL; SAND 2' | 1 |
| 2–3 | 2 | 24/0 | 2-4 | 3-2 2-4 | NA | NO RECOVERY. | NO RECOVERY 4' | 2 |
| 4–5 | 3 | 24/24 | 4-6 | 1-2 2-4 | ND | Loose, light brown, fine to medium SAND, little Silt, moist. | SAND 6' | |
| 6–7 | 4 | 24/0 | 6-8 | 3-2 4-4 | NA | NO RECOVERY. | NO RECOVERY 8' | |
| 8–9 | 5 | 24/18 | 8-10 | 2-3 3-3 | ND | Loose, light brown, fine SAND, some Silt, wet. | SAND | 3 4 |
| 10–11 | 6 | 24/24 | 10-12 | 1-1 1-1 | ND | Very loose, light brown, fine SAND, some Silt, wet. Changing at 11.5 feet to: Brown, fine to coarse SAND, some Silt, wet. | | |
| 12–13 | 7 | 24/24 | 12-14 | 3-7 4-6 | ND | Medium dense, brown, fine to coarse SAND, some Silt, trace Rock fragments, wet. | | |
| 14–15 | 8 | 24/24 | 14-16 | 1-3 5-8 | ND | Loose, brown, fine to coarse SAND, little Silt, trace Rock fragments, wet. | | |
| 16–17 | 9 | 24/24 | 16-18 | 7-11 13-36 | ND | Medium dense, fine to coarse SAND, little Silt, wet. | | |
| 18–19 | 10 | 24/24 | 18-20 | 4-10 9-11 | ND | Medium dense, brown, fine to coarse SAND, little fine Gravel, little Silt, wet. | | 5 |
| 20–21 | 11 | 24/24 | 20-22 | 6-19 21-18 | ND | Dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | |
| 22–23 | 12 | 24/24 | 22-24 | 6-16 15-15 | ND | Dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | |
| 24–25 | 13 | 24/24 | 24-26 | 10-17 18-16 | ND | Dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | |
| 26–27 | 14 | 24/24 | 26-28 | 2-6 10-9 | ND | Dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. Changing at 26.5 feet to: Brown, fine SAND and Silt with 17 to 18-inch brown, Silty CLAY lenses. | | 6 |
| 28–29 | 15 | 24/24 | 28-30 | 4-6 6-15 | ND | Medium dense, brown, fine to coarse SAND, little Silt, wet. Changing at 28.8 feet to: Brown, Silty CLAY, little fine Sand, wet. | 28.8' Silty CLAY 30.5' | |
| 30–31 | 16 | 24/24 | 30-32 | 5-8 8-10 | ND | Medium dense, brown, fine to coarse SAND, little Silt, wet. Changing at 30.5 feet to: Brown, CLAY & SILT, little fine Sand, wet. | CLAY & SILT 32' | |
| 32–33 | 17 | 24/12 | 32-34 | 2-4 10-13 | ND | Stiff, brown, Clayey SILT, little fine Sand, wet. | Clayey SILT 34' | |
| 34–35 | 18 | 24/24 | 34-36 | 8-9 22-40 | ND | Dense, brown, fine SAND and SILT, wet. | SAND 36' | 7 |
| 36–37 | 19 | 24/24 | 36-38 | 7-16 26-21 | ND | Hard, gray, Silty CLAY, wet. | Silty CLAY | |
| 38–39 | 20 | 24/24 | 38-40 | 4-9 15-17 | ND | Very stiff, brown and gray, Silty CLAY, wet. | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).
2. During drilling to 4.0 feet below ground surface, sediment appeared to be Sand.
3. Groundwater was encountered at approximately 8.0 feet below ground surface.
4. Temporary well installed from 8.0 to 18.0 feet below ground surface. Well screen interval from 13.0 to 18.0 feet below ground surface. Purged 30.0 gallons of water.
5. Temporary well installed from 18.0 to 28.0 feet below ground surface. Well screen interval from 23.0 to 28.0 feet below ground surface. Purged 20.0-25.0 gallons of water.
6. Temporary well installed from 26.0 to 36.0 feet below ground surface. Well screen interval from 31.0 to 36.0 feet below ground surface. Purged 20.0-25.0 gallons of water.
7. Casing was set at 36.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW.WOLVEN AVENUE.GPJ GZA_CORP.GDT 4/20/20

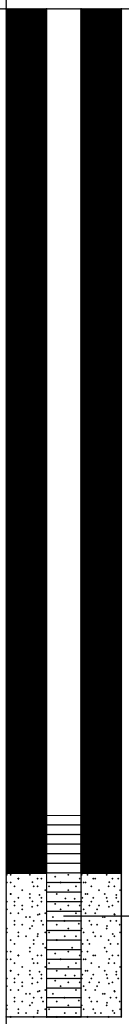
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10M
**Page:** 2 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 41 | 21 | 24/24 | 40-42 | 5-10 14-15 | ND | Very stiff, brown and gray, Silty CLAY, wet. | Silty CLAY | |
| 42–43 | 22 | 24/24 | 42-44 | 3-6 8-13 | ND | Stiff, brown and gray, Silty CLAY, wet. | | |
| 44–45 | 23 | 24/24 | 44-46 | 3-3 6-11 | ND | Stiff, brown and gray, Silty CLAY, wet. | | |
| 46–47 | 24 | 24/24 | 46-48 | 2-5 10-15 | ND | Stiff, brown and gray, Silty CLAY, wet. Changing at 47.5 feet to: Stiff, brown and gray, Silty CLAY, trace fine Sand, wet. | | |
| 48–49 | 25 | 24/24 | 48-50 | 6-7 11-16 | ND | Very stiff, brown and gray, Silty CLAY, trace Fine Sand, wet. | | |
| 50–51 | 26 | 24/24 | 50-52 | 12-17 <1-21 | ND | Hard, brown and gray, Silty CLAY, trace fine Sand, wet. | | |
| 52–53 | 27 | 24/24 | 52-54 | 4-15 21-19 | ND | Hard, brown and gray, Silty CLAY, trace fine Sand, wet. Changing at 53.5 feet to: Brown and gray, fine SAND and Silt, little Clay, wet. | 53.5' 54' SAND | |
| 54–55 | 28 | 24/24 | 54-56 | 5-11 17-20 | ND | | Silty CLAY | |
| 56–57 | 29 | 24/24 | 56-58 | 8-16 20-27 | ND | Very stiff, brown and gray, Silty CLAY with Sandy lenses 12-18 inches and black smear at 18 inches. | 57.2' 58' CLAY & SILT | |
| 58–59 | 30 | 24/24 | 58-60 | 4-8 17-22 | ND | Hard, brown and gray, Silty CLAY, wet. Changing at 57.2 feet to: Brown and gray, CLAY & SILT, trace fine to coarse Sand, wet. | Silty CLAY 59.5' | |
| 60–61 | 31 | 24/24 | 60-62 | 8-14 15-22 | ND | | 60' CLAY & SILT Clayey SILT | |
| 62–63 | 32 | 24/24 | 62-64 | 3-7 22-27 | ND | Very stiff, brown and gray, Silty CLAY, trace fine Sand, wet. Changing at 59.5 feet to: Brown and gray, CLAY & SILT, trace fine to coarse Sand, wet. | 62' Silty CLAY 63.6' | |
| 64–65 | 33 | 24/24 | 64-66 | 6-44-50/6" | ND | Very stiff, Clayey SILT, little fine to coarse Sand, wet. | 64.3' SAND 65' Silty CLAY | 8 |
| 66–67 | 34 | 24/6 | 66-68 | 22-50/4" | ND | Very stiff, Silty CLAY, trace fine Sand, wet. Changing at 63.6 feet to: Brown, fine to coarse SAND and Silt, little fine Gravel, wet. | 65.5' SAND Clayey SILT | 9 |
| 68–69 | 35 | 24/18 | 68-70 | 17-35-50/6" | ND | Very dense, brown, fine to medium SAND, some Silt, wet. Changing at 64.3 feet t: Brown and gray, Silty CLAY, trace fine to coarse Sand, wet. Changing at 65.0 feet to: Brown, fine to coarse SAND, little Gravel, some Silt, wet. Changing at 65.5 feet to: Brown, Clayey SILT, little fine to coarse Sand, wet. | 68' SAND | 10 |
| 70–71 | 36 | 24/21 | 70-72 | 3-8 22-50/3" | ND | | | |
| 72–73 | 37 | 24/18 | 72-74 | 2-14-50/6" | ND | | | |
| 74–75 | 38 | 24/18 | 74-76 | 8-29-50/6" | ND | Hard, brown, Clayey SILT, little fine to coarse Sand, wet. | 75' | |
| 76–77 | 39 | 24/15 | 76-78 | 17-30-50/3" | ND | Very dense, gray and brown, fine to coarse SAND, little Silt, trace Gravel, wet. Dense, gray and brown, fine to medium SAND, little Silt, wet. Dense, gray and brown, fine to medium SAND, little Silt, wet with Silty Clay 15 to 16 inches. Very dense, gray and brown, fine to medium SAND, little Silt, wet. Bottom of Borehole at 75 Feet | | 11 |

**Equipment Installed**




**REMARKS**

8. Switched to 3.0-inch split spoon at 64.0 feet below ground surface.
9. Temporary well installed from 66.0 to 76.0 feet below ground surface. Well screen interval from 71.0 to 66.0 feet below ground surface. Purged 34.0 gallons of water.
10. Swiched to 2.0-inch split spoon at 68.0 feet below ground surface.
11. Monitoring well was installed in borehole upon completion. Well screen set from approximately 71.0 to 75.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 4/20/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10S
**Page:** 1 **of** 5
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Zach/Travis
**Logged by:** C. Melby
**Date Start/Finish:** 3-5-19 / 3-9-19
**Boring Location:**
**GS Elev.:** **Datum:** MI State Plane S Zone NAD 83

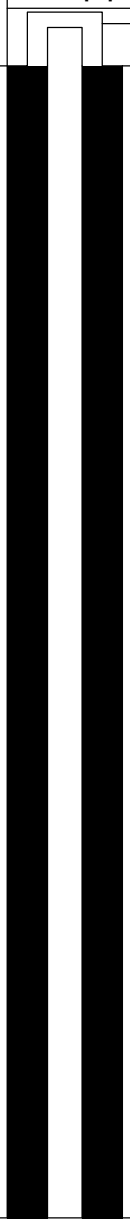
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/12 | 0-2 | 3-1 1-4 | ND | Very loose, dark brown, TOPSOIL. Changing at 0.5 feet to: Brown, fine SAND, some Silt, trace Gravel, dry. | TOPSOIL 0.5' SAND | 1 |
| 1 | | | | | | | | |
| 2 | 2 | 24/0 | 2-4 | 3-2 2-4 | NA | NO RECOVERY. | 2' NO RECOVERY | 2 |
| 3 | | | | | | | | |
| 4 | 3 | 24/24 | 4-6 | 1-2 2-4 | ND | Loose, light brown, fine to medium SAND, little Silt, moist. | 4' SAND | |
| 5 | | | | | | | | |
| 6 | 4 | 24/0 | 6-8 | 3-2 4-4 | NA | NO RECOVERY. | 6' NO RECOVERY | |
| 7 | | | | | | | | |
| 8 | 5 | 24/18 | 8-10 | 2-3 3-3 | ND | Loose, light brown, fine SAND, some Silt, wet. | 8' SAND | 3 4 |
| 9 | | | | | | | | |
| 10 | 6 | 24/24 | 10-12 | 1-1 1-1 | ND | Very loose, light brown, fine SAND, some Silt, wet. Changing at 11.5 feet to: Brown, fine to coarse SAND, some Silt, wet. | | |
| 11 | | | | | | | | |
| 12 | 7 | 24/24 | 12-14 | 3-7 4-6 | ND | Medium dense, brown, fine to coarse SAND, some Silt, trace Rock fragments, wet. | | |
| 13 | | | | | | | | |
| 14 | 8 | 24/24 | 14-16 | 1-3 5-8 | ND | Loose, brown, fine to coarse SAND, little Silt, trace Rock fragments, wet. | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).
2. During drilling to 4.0 feet below ground surface, sediment appeared to be Sand.
3. Groundwater was encountered at approximately 8.0 feet below ground surface.
4. Temporary well installed from 8.0 to 18.0 feet below ground surface. Well screen interval from 13.0 to 18.0 feet below ground surface. Purged 30.0 gallons of water.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-10S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10S
**Page:** 2 **of** 5
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 16 | 9 | 24/24 | 16-18 | 7-11 13-36 | ND | Medium dense, fine to coarse SAND, little Silt, wet. | | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/24 | 18-20 | 4-10 9-11 | ND | Medium dense, brown, fine to coarse SAND, little fine Gravel, little Silt, wet. | | 5 | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/24 | 20-22 | 6-19 21-18 | ND | Dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/24 | 22-24 | 6-16 15-15 | ND | Dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/24 | 24-26 | 10-17 18-16 | ND | Dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. | | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/24 | 26-28 | 2-6 10-9 | ND | Dense, brown, fine to coarse SAND, little Gravel, little Silt, wet. Changing at 26.5 feet to: Brown, fine SAND and Silt with 17 to 18-inch brown, Silty CLAY lenses. | | 6 | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/24 | 28-30 | 4-6 6-15 | ND | Medium dense, brown, fine to coarse SAND, little Silt, wet. Changing at 28.8 feet to: Brown, Silty CLAY, little fine Sand, wet. | 28.8' Silty CLAY | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/24 | 30-32 | 5-8 8-10 | ND | Medium dense, brown, fine to coarse SAND, little Silt, wet. Changing at 30.5 feet to: Brown, CLAY & SILT, little fine Sand, wet. | 30.5' CLAY & SILT | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/12 | 32-34 | 2-4 | ND | Stiff, brown, Clayey SILT, little fine Sand, | 32' Clayey SILT | | |

**REMARKS**

5. Temporary well installed from 18.0 to 28.0 feet below ground surface. Well screen interval from 23.0 to 28.0 feet below ground surface. Purged 20.0-25.0 gallons of water.
6. Temporary well installed from 26.0 to 36.0 feet below ground surface. Well screen interval from 31.0 to 36.0 feet below ground surface. Purged 20.0-25.0 gallons of water.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10S
**Page:** 3 **of** 5
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 10-13 | | wet. | Clayey SILT | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/24 | 34-36 | 8-9 22-40 | ND | Dense, brown, fine SAND and SILT, wet. | 34' SAND | | Bentonite/Grout |
| 35 | | | | | | | | 7 | |
| 36 | 19 | 24/24 | 36-38 | 7-16 26-21 | ND | Hard, gray, Silty CLAY, wet. | 36' Silty CLAY | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/24 | 38-40 | 4-9 15-17 | ND | Very stiff, brown and gray, Silty CLAY, wet. | | | |
| 39 | | | | | | | | | |
| 40 | 21 | 24/24 | 40-42 | 5-10 14-15 | ND | Very stiff, brown and gray, Silty CLAY, wet. | | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/24 | 42-44 | 3-6 8-13 | ND | Stiff, brown and gray, Silty CLAY, wet. | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/24 | 44-46 | 3-3 6-11 | ND | Stiff, brown and gray, Silty CLAY, wet. | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/24 | 46-48 | 2-5 10-15 | ND | Stiff, brown and gray, Silty CLAY, wet. Changing at 47.5 feet to: Stiff, brown and gray, Silty CLAY, trace fine Sand, wet. | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/24 | 48-50 | 6-7 11-16 | ND | Very stiff, brown and gray, Silty CLAY, trace Fine Sand, wet. | | | |
| 49 | | | | | | | | | |

**REMARKS**

7. Casing was set at 36.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-10S

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10S
**Page:** 4 **of** 5
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 26 | 24/24 | 50-52 | 12-17 <1-21 | ND | Hard, brown and gray, Silty CLAY, trace fine Sand, wet. | Silty CLAY | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/24 | 52-54 | 4-15 21-19 | ND | Hard, brown and gray, Silty CLAY, trace fine Sand, wet. Changing at 53.5 feet to: Brown and gray, fine SAND and Silt, little Clay, wet. | | | |
| 53 | | | | | | | 53.5' SAND | | |
| 54 | 28 | 24/24 | 54-56 | 5-11 17-20 | ND | Very stiff, brown and gray, Silty CLAY with Sandy lenses 12-18 inches and black smear at 18 inches. | 54' Silty CLAY | | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/24 | 56-58 | 8-16 20-27 | ND | Hard, brown and gray, Silty CLAY, wet. Changing at 57.2 feet to: Brown and gray, CLAY & SILT, trace fine to coarse Sand, wet. | | | |
| 57 | | | | | | | 57.2' CLAY & SILT | | |
| 58 | 30 | 24/24 | 58-60 | 4-8 17-22 | ND | Very stiff, brown and gray, Silty CLAY, trace fine Sand, wet. Changing at 59.5 feet to: Brown and gray, CLAY & SILT, trace fine to coarse Sand, wet. | 58' Silty CLAY | | |
| 59 | | | | | | | 59.5' CLAY & SILT | | |
| 60 | 31 | 24/24 | 60-62 | 8-14 15-22 | ND | Very stiff, Clayey SILT, little fine to coarse Sand, wet. | 60' Clayey SILT | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/24 | 62-64 | 3-7 22-27 | ND | Very stiff, Silty CLAY, trace fine Sand, wet. Changing at 63.6 feet to: Brown, fine to coarse SAND and Silt, little fine Gravel, wet. | 62' Silty CLAY | | |
| 63 | | | | | | | 63.6' SAND | | |
| 64 | 33 | 24/24 | 64-66 | 6-44-50/6" | ND | Very dense, brown, fine to medium SAND, some Silt, wet. Changing at 64.3 feet t: Brown and gray, Silty CLAY, trace fine to coarse Sand, wet. Changing at 65.0 feet to: Brown, fine to coarse SAND, little Gravel, some Silt, wet. Changing at 65.5 feet to: Brown, Clayey SILT, little fine to coarse Sand, wet. | 64.3' Silty CLAY | 8 | |
| 65 | | | | | | | 65' SAND | | |
| 66 | 34 | 24/6 | 66-68 | 22-50/4" | ND | Hard, brown, Clayey SILT, little fine to coarse Sand, wet. | 65.5' Clayey SILT | 9 | |
| 67 | | | | | | | | | |

**REMARKS**

8. Switched to 3.0-inch split spoon at 64.0 feet below ground surface.
9. Temporary well installed from 66.0 to 76.0 feet below ground surface. Well screen interval from 71.0 to 66.0 feet below ground surface. Purged 34.0 gallons of water.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-10S

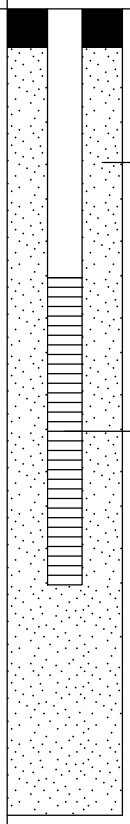
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-10S
**Page:** 5 **of** 5
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 68 | 35 | 24/18 | 68-70 | 17-35-50/6" | ND | Very dense, gray and brown, fine to coarse SAND, little Silt, trace Gravel, wet. | Clayey SILT 68' SAND | 10 |
| 69 | | | | | | | | |
| 70 | 36 | 24/21 | 70-72 | 3-8 22-50/3" | ND | Dense, gray and brown, fine to medium SAND, little Silt, wet. | | |
| 71 | | | | | | | | |
| 72 | 37 | 24/18 | 72-74 | 2-14-50/6" | ND | Dense, gray and brown, fine to medium SAND, little Silt, wet with Silty Clay 15 to 16 inches. | | |
| 73 | | | | | | | | |
| 74 | 38 | 24/18 | 74-76 | 8-29-50/6" | ND | Very dense, gray and brown, fine to medium SAND, little Silt, wet. | | |
| 75 | | | | | | | | |
| 76 | 39 | 24/15 | 76-78 | 17-30-50/3" | ND | Hard, gray, Silty CLAY, wet. | | |
| 77 | | | | | | | | |
| 78 | | | | | | Bottom of Borehole at 78.8 Feet | 78' | 11 |
| 79 | | | | | | | | |
| 80 | | | | | | | | |
| 81 | | | | | | | | |
| 82 | | | | | | | | |
| 83 | | | | | | | | |
| 84 | | | | | | | | |

**Equipment Installed**




**REMARKS**

10. Swiched to 2.0-inch split spoon at 68.0 feet below ground surface.
11. Monitoring well was installed in borehole upon completion. Well screen set from approximately 71.0 to 75.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-10S

BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 1 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry H., Travis & Zach/Gary
**Logged by:** John Morehouse
**Date Start/Finish:** 1-3-19 / 1-9-19
**Boring Location:** 11 Mile Rd & Algoma Ave NE, Rockford, MI
**GS Elev.:** No Surveyed **Datum:** NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

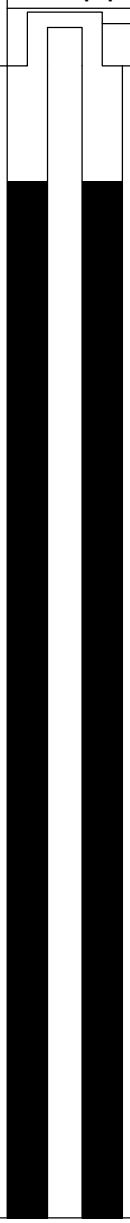
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NM | NM | NM | NM | NM |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/20.4 | 0-2 | 1-0<br>1-2 | ND | Black, fine to medium-grained SAND, little Silt, slightly cohesive, moist. Changing at 0.7 feet to: Dark yellowish-brown, CLAY & SILT, plastic, cohesive, moist. Changing at 1.7 feet to: NO RECOVERY. | SAND<br>0.7'<br>CLAY & SILT<br>1.7' | 1 |
| 2 | 2 | 24/24 | 2-4 | 2-3<br>3-5 | ND | Dark yellowish-brown, CLAY & SILT, plastic, cohesive, moist. Changing at 2.7 feet to: Mottled, yellowish-brown, CLAY & SILT, little Sand, plastic, cohesive, moist. Changing at 3.5 feet to: Light brownish-gray, SILT, little Clay, moderately plastic, cohesive, moist. Changing at 3.8 feet to: Yellowish-brown, fine to medium grained SAND, little Silt. wet. | NO RECOVERY<br>2'<br>CLAY & SILT<br>3.5'<br>SILT<br>3.8' | |
| 3 | | | | | | | | |
| 4 | 3 | 24/15.6 | 4-6 | 1-2<br>3-3 | ND | Yellowish-brown, fine to medium grained SAND, little Silt. wet. Changing at 5.3 feet to: NO RECOVERY. | SAND<br>5.3'<br>NO RECOVERY | 2 |
| 5 | | | | | | | | |
| 6 | 4 | 24/24 | 6-8 | 3-2<br>4-5 | ND | Brown, CLAY & SILT, plastic, cohesive, moist. Changing at 6.2 feet to: Yellowish-brown, fine to medium grained SAND, little Silt, wet. Changing at 6.4 feet to: Brown, CLAY & SILT, plastic, cohesive, moist. Changing at 7.5 feet to: Yellowish-brown, CLAY & SILT, plastic, cohesive, moist. Changing at 7.6 feet to: Brown, CLAY & SILT, plastic, cohesive, moist. Changing at 7.8 feet to: Yellowish-brown, fine to medium grained SAND, little Silt, wet. Changing at 7.9 feet to: Brown, CLAY & SILT, plastic, cohesive, moist. | 6'<br>6.2' CLAY & SILT<br>6.4' SAND<br>CLAY & SILT<br>7.5'<br>7.6' SAND<br>7.8' CLAY & SILT<br>7.9' SAND<br>CLAY & SILT | |
| 7 | | | | | | | | |
| 8 | 5 | 24/16.8 | 8-10 | 2-3<br>3-5 | ND | Brown, CLAY & SILT, plastic, cohesive, moist. Changing at 8.5 feet to: Yellowish-brown, fine to medium grained SAND, trace Silt, wet. Changing at 8.6 feet to: Brown, CLAY & SILT, plastic, cohesive, moist. Changing at 9.4 feet to: NO | 8.5'<br>8.6' SAND<br>CLAY & SILT<br>9.4'<br>NO RECOVERY<br>10' | |
| 9 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).
2. Groundwater was encountered at approximately 3.8 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 2 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 6 | 24/24 | 10-12 | | ND | RECOVERY. Yellowish-brown, fine to medium grained SAND, trace Silt, wet. Changing at 10.4 feet to: Grayish-brown, CLAY & SILT, plastic, cohesive, moist. Changing at 11.5 feet to: Light brownish-gray, fine grained SAND, some Silt, little Clay, moderately plastic, cohesive, wet. Changing at 11.6 feet to: Grayish-brown, CLAY & SILT, plastic, cohesive, moist. | SAND; 10.4' CLAY & SILT; 11.5' SAND; 11.6' CLAY & SILT | | |
| 11 | | | | | | | | | |
| 12 | 7 | 24/18 | 12-14 | 3-1 2-3 | ND | Grayish-brown, CLAY & SILT, plastic, cohesive, moist. Changing at 12.2 feet to: Brown, fine to medium grained SAND, trace Silt, wet. Changing at 12.4 feet to: Grayish-brown, CLAY & SILT, plastic, cohesive, moist. Changing at 13.5 feet to: NO RECOVERY. | 12.2' SAND; 12.4' CLAY & SILT; 13.5' NO RECOVERY | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/14.4 | 14-16 | 1-2 3-5 | ND | Grayish-brown, CLAY & SILT, plastic, cohesive, moist. Changing at 15.2 feet to: NO RECOVERY. | 14' CLAY & SILT; 15.2' NO RECOVERY | | |
| 15 | | | | | | | | | |
| 16 | 9 | 24/14.4 | 16-18 | 2-4-2 | ND | Very dark brown, PEAT, some Silt, little Clay, plastic, cohesive, moist. Changing at 16.4 feet to: Dark yellowish-brown to yellowish-brown, fine to medium grained SAND, trace Silt, moist. Changing at 17.1 feet to: Yellowish-brown to brown, CLAY & SILT, plastic, cohesive, moist. Changing at 17.2 feet to: NO RECOVERY. | 16' PEAT; 16.4' SAND; 17.1' CLAY & SILT; 17.2' NO RECOVERY | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/13.2 | 18-20 | 1-2 3-6 | ND | Yellowish-brown to brown, CLAY & SILT, plastic, cohesive, moist. Changing at 18.5 feet to: Dark brown, GRAVEL, some coarse to medium grained Sand, trace Silt, wet. Changing at 18.8 feet to: Yellowish-brown, CLAY & SILT, plastic, cohesive, moist. Changing at 19.1 feet to: NO RECOVERY. | 18' CLAY & SILT; 18.5' GRAVEL; 18.8' CLAY & SILT; 19.1' NO RECOVERY | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/18 | 20-22 | 2-2 3-5 | ND | Yellowish-brown, fine grained SAND, trace Silt, wet. Changing at 20.5 feet to: Dark brown to yellowish-brown, medium to coarse grained SAND, some Gravel, trace Silt, wet; occasional very thin seams of Silty Clay, trace Gravel. Changing at 21.5 feet to: NO RECOVERY. | 20' SAND; 21.5' | | |
| 21 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 3 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 22 | 12 | 24/12 | 22-24 | 3-5<br>4-3 | ND | Dark brown to yellowish-brown, medium to coarse grained SAND, some Gravel, trace Silt, moist. Changing at 23.0 feet to: NO RECOVERY. | NO RECOVERY<br>22' SAND<br>23' NO RECOVERY | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/13.2 | 24-26 | 1-0<br>2-3 | ND | Yellowish-brown, medium grained SAND, trace Silt, wet. Changing at 24.9 feet to: Dark brown to yellowish-brown, medium to coarse grained SAND, some Gravel, trace Silt, wet. Changing at 25.1 feet to: NO RECOVERY. | 24' SAND<br>25.1' NO RECOVERY | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/8.4 | 26-28 | 2-4<br>4-4 | ND | Brown, fine to coarse grained SAND, little Gravel, trace Silt, wet. Changing at 26.7 feet to: NO RECOVERY. | 26' SAND<br>26.7' NO RECOVERY | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/15.6 | 28-30 | 3-4<br>3-4 | ND | Brown, fine to coarse grained SAND, little Gravel, trace Silt, wet. Changing at 29.3 feet to: No RECOVERY. | 28' SAND<br>29.3' NO RECOVERY | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/15.6 | 30-32 | 2-2<br>6-5 | ND | Brown, fine to coarse grained SAND, little Gravel, trace Silt, wet. Changing at 31.1 feet to: Brown, Silty CLAY, plastic, cohesive, moist. Changing at 31.3 feet to: NO RECOVERY. | 30' SAND<br>31.1' CLAY<br>31.3' NO RECOVERY | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/16.8 | 32-34 | 28-18<br>13-16 | ND | Brown, medium to coarse grained SAND, trace Silt, wet. Changing at 32.9 feet to: NO RECOVERY. | 32' SAND<br>32.9' NO RECOVERY | | |
| 33 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 4 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NO RECOVERY | | |
| 34 | 18 | 24/18 | 34-36 | 3-4<br>7-8 | ND | Dark gray, Silty CLAY, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 35.5 feet to: No RECOVERY. | 34' Silty CLAY | | |
| 35 | | | | | | | 35.5' NO RECOVERY | | |
| 36 | 19 | 24/22.8 | 36-38 | 2-4<br>6-8 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 37.9 feet to: NO RECOVERY. | 36' CLAY & SILT | | |
| 37 | | | | | | | 37.9' | | |
| 38 | 20 | 24/24 | 38-40 | 2-7<br>6-5 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. | 38' NO RECOVERY CLAY & SILT | | |
| 39 | | | | | | | | | |
| 40 | 21 | 24/21.6 | 40-42 | 4-5<br>7-10 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 41.8 feet to: No RECOVERY. | | | |
| 41 | | | | | | | 41.8' | | |
| 42 | 22 | 24/22.8 | 42-44 | 3-6<br>8-10 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 43.9 feet to: NO RECOVERY. | 42' NO RECOVERY CLAY & SILT | | |
| 43 | | | | | | | 43.9' | | |
| 44 | 23 | 24/24 | 44-46 | 3-5<br>7-10 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. | 44' NO RECOVERY CLAY & SILT | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 5 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | CLAY & SILT | | |
| 46 | 24 | 24/21.6 | 46-48 | 2-4<br>5-9 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 47.8 feet to: NO RECOVERY. | | | |
| 47 | | | | | | | | | |
| | | | | | | | 47.8' | | |
| 48 | 25 | 24/21.6 | 48-50 | 8-14<br>11-15 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 49.4 feet to: Brown, SILT & CLAY, some Sand, little Gravel, plastic, cohesive, moist. Changing at 49.6 feet to: Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 49.8 feet to: NO RECOVERY. | 48' NO RECOVERY<br>CLAY & SILT | | |
| 49 | | | | | | | 49.4' | | |
| | | | | | | | 49.6' SILT & CLAY | | |
| | | | | | | | 49.8' CLAY & SILT | | |
| 50 | 26 | 24/14.4 | 50-52 | 2-2<br>6-9 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 51.2 feet to: NO RECOVERY. | 50' NO RECOVERY<br>CLAY & SILT | | |
| 51 | | | | | | | 51.2' | | |
| | | | | | | | NO RECOVERY | | |
| 52 | 27 | 24/21.6 | 52-54 | 2-7<br>11-14 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 53.8 feet to: NO RECOVERY. | 52'<br>CLAY & SILT | | |
| 53 | | | | | | | | | |
| | | | | | | | 53.8' | | |
| 54 | 28 | 24/18 | 54-56 | 4-21-22 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 55.4 feet to: Brown, fine to medium grained SAND, little Silt, moist to wet. Changing at 55.5 feet to: NO RECOVERY. | 54' NO RECOVERY<br>CLAY & SILT | | |
| 55 | | | | | | | 55.4' | | |
| | | | | | | | 55.5' SAND | | |
| | | | | | | | NO RECOVERY | | |
| 56 | 29 | 24/21.6 | 56-58 | 3-9<br>13-20 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 57.4 feet to: Dark | 56'<br>CLAY & SILT | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 6 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 57 | | | | | | grayish-brown, fine to medium grained SAND, little Silt, little Clay, slightly plastic, cohesive, moist. Changing at 57.8 feet to: NO RECOVERY. | CLAY & SILT<br>57.4'<br>SAND<br>57.8' | | |
| 58 | 30 | 24/20.4 | 58-60 | 4-10<br>13-16 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 59.7 feet to: NO RECOVERY. | 58' NO RECOVERY<br>CLAY & SILT | | |
| 59 | | | | | | | 59.7' | | |
| 60 | 31 | 24/14.4 | 60-62 | 3-10<br>24-15 | ND | Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 61.2 feet to: NO RECOVERY. | 60' NO RECOVERY<br>CLAY & SILT | | |
| 61 | | | | | | | 61.2' | | |
| 62 | 32 | 24/21.6 | 62-64 | 25-8-10 | ND | Dark grayish-brown, CLAY & SILT, some Sand, trace Gravel, moderately plastic, cohesive, moist. Changing at 63.8 feet to: NO RECOVERY. | NO RECOVERY<br>62'<br>SILT & CLAY | | |
| 63 | | | | | | | 63.8' | | |
| 64 | 33 | 24/22.8 | 64-66 | 6-10<br>15-26 | ND | Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 65.3 feet to: Dark grayish-brown, medium grained SAND, trace Silt, wet. Changing at 65.9 feet to: NO RECOVERY. | 64' NO RECOVERY<br>Silty CLAY | | |
| 65 | | | | | | | 65.3'<br>SAND | | |
| 66 | 34 | 24/20.4 | 66-68 | 27-28<br>21-30 | ND | Dark grayish-brown, fine to medium grained SAND, trace Silt, wet. Changing at 66.1 feet to: Dark grayish-brown, SILT, little fine grained Sand, non-plastic, cohesive, wet. Changing at 66.4 feet to: Dark grayish-brown, SILT & CLAY, some Sand, trace Gravel, moderately plastic, cohesive, moist. Changing at 66.7 feet to: Dark grayish-brown, fine to medium grained SAND, trace Silt, wet. Changing at 67.4 feet to: Dark grayish-brown, SILT, little Clay, | 65.9'<br>66' NO RECOVERY<br>66.1'<br>66.4' SAND<br>SILT<br>66.7' SILT & CLAY<br>SAND | | |
| 67 | | | | | | | 67.4'<br>SILT<br>67.7' | | |
| 68 | 35 | 24/21.6 | 68-70 | 15-20<br>25-50 | ND | | 68' NO RECOVERY<br>68.2' SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 7 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 69 | | | | | | plastic, cohesive, moist to wet. Changing at 67.7 feet to: NO RECOVERY. Dark grayish-brown, fine to medium grained SAND, trace Silt. wet. Changing at 68.2 feet to: Dark grayish-brown, SILT & CLAY, some Sand, trace Gravel, moderately plastic, cohesive, moist. Changing at 69.4 feet to: Dark grayish-brown, CLAY & SILT, little Sand, trace Gravel, moderately plastic, cohesive, moist. Changing at 69.6 feet to: Varved, dark grayish-brown, SILT, with alternating layers of Silty Clay, plastic, cohesive, moist. Changing at 69.8 feet to: NO RECOVERY. | SILT & CLAY<br>69.4'<br>69.6' CLAY & SILT<br>69.8' SILT<br>70' NO RECOVERY | | |
| 70 | 36 | 24/22.8 | 70-72 | 33-48-50/3" | ND | | SAND | | |
| 71 | | | | | | Brown, fine to medium grained SAND, trace Silt, wet. Changing at 71.4 feet to: Grayish-brown, SILT, trace Clay, trace fine grained Sand, moderately plastic, cohesive, moist to wet. Changing at 71.7 feet to: Brown, fine to medium grained SAND, trace Silt, wet. Changing at 71.9 feet to: NO RECOVERY. Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 72.2 feet to: NO RECOVERY. | 71.4'<br>SILT<br>71.7'<br>71.9' SAND<br>72' NO RECOVERY<br>72.2' Silty CLAY<br>NO RECOVERY | | |
| 72 | 37 | 24/2.4 | 72-74 | 55/3" | ND | | | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/2.4 | 74-76 | 57/2" | ND | Dark grayish-brown, SILT & CLAY, some Sand, plastic, cohesive, moist. Changing at 74.2 feet to: NO RECOVERY. | 74'<br>74.2' SILT & CLAY<br>NO RECOVERY | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/22.8 | 76-78 | 10-22<br>26-24 | ND | Grayish-brown to dark grayish-brown, CLAY & SILT, little Gravel, little Sand, plastic, cohesive, moist. Changing at 77.1 feet to: Varved grayish-brown to dark grayish-brown, SILT, some fine grained Sand, trace Clay, with fine grained SAND, slightly plastic, cohesive, moist. Changing at 77.4 feet o: Dark gray, Silty CLAY, plastic, cohesive, moist. Changing at 77.9 feet to: NO RECOVERY. | 76'<br>CLAY & SILT<br>77.1'<br>SILT<br>77.4'<br>Silty CLAY<br>77.9' | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/18 | 78-80 | 7-11<br>14-30 | ND | Dark gray, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 78.4 feet to: Brown, fine to medium grained SAND, little Silt, moist. Changing 78.8 feet to: Dark gray, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 79.5 feet to: NO RECOVERY. | 78' NO RECOVERY<br>78.4' Silty CLAY<br>SAND<br>78.8'<br>Silty CLAY<br>79.5'<br>NO RECOVERY<br>80' | | Bentonite Grout |
| 79 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 8 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 41 | 24/21.6 | 80-82 | 12-25<br>33-40 | ND | Dark gray, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 80.4 feet to: Brown, fine to medium grained SAND, little Silt, wet. Changing at 80.5 feet to: Dark gray, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 80.8 feet to: Brown, fine to medium grained SAND, little Silt, wet. Changing at 81.0 feet to: Dark gray, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 81.4 feet to: Brown, fine to medium grained SAND, little Silt, wet. Changing at 81.6 feet to: Dark gray, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 81.8 feet to: NO RECOVERY. Brown, fine to medium grained SAND, trace Silt, wet. Changing at 83.2 feet to: NO RECOVERY. | Silty CLAY<br>80.4'<br>80.5' SAND<br>80.8' Silty CLAY<br>81' SAND<br>Silty CLAY<br>81.4'<br>81.6' SAND<br>81.8' Silty CLAY<br>82' NO RECOVERY<br>SAND<br>83.2'<br>NO RECOVERY | | |
| 81 | | | | | | | | | |
| 82 | 42 | 24/14.4 | 82-84 | 0-0<br>2-6 | ND | | | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/19.2 | 84-86 | 8-16-50/4" | ND | Brown, fine to medium SAND, trace Silt, wet. Changing at 85.4 feet to: Brown, GRAVEL, some coarse Sand, trace Silt, wet. Changing at 85.8 feet to: NO RECOVERY. | 84'<br>SAND<br>85.4'<br>GRAVEL<br>85.8' | | |
| 85 | | | | | | | | | |
| 86 | 44 | 24/21.6 | 86-88 | 49-28<br>39-50 | ND | Brown, fractured COBBLE. Changing at 86.5 feet to: Brown, fine to medium SAND, some Silt, slightly cohesive, moist to wet. Changing at 87.4 feet to: Brown, Silty CLAY, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 87.6 feet to: NO RECOVERY. | 86' NO RECOVERY<br>Fractured COBBLE<br>86.5' SAND<br>87.4'<br>87.6' Silty CLAY<br>NO RECOVERY | | |
| 87 | | | | | | | | | |
| 88 | 45 | 24/8.4 | 88-90 | 19-39-50/3" | ND | Dark grayish-brown, SILT & CLAY, some Sand, trace Gravel, plastic, cohesive, moist. Changing at 88.7 feet to: NO RECOVERY. | 88'<br>SILT & CLAY<br>88.7'<br>NO RECOVERY | | |
| 89 | | | | | | | | | |
| 90 | 46 | 24/1.2 | 90-92 | 56/4" | ND | Dark grayish-brown, SILT & CLAY, some Sand, trace Gravel, plastic, cohesive, moist. Changing at 90.1 feet to: NO RECOVERY. | 90'<br>90.1' SILT & CLAY<br>NO RECOVERY | | |
| 91 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 9 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 92 | 47 | 24/18 | 92-94 | 20-50-24 | ND | Dark grayish-brown, SILT & CLAY, some Sand, trace Gravel, plastic, cohesive, moist. Changing at 92.7 feet to: Dark brown, GRAVEL, some fine to coarse grained Sand, wet. Changing at 92.9 feet to: Dark grayish-brown, SILT & CLAY, some Sand, trace Gravel, plastic, cohesive, moist. Changing at 93.5 feet to: NO RECOVERY. | 92' SILT & CLAY; 92.7' GRAVEL; 92.9' SILT & CLAY; 93.5' NO RECOVERY | | |
| 93 | | | | | | | | | |
| 94 | 48 | 24/20.4 | 94-96 | 14-24 39-44 | ND | Dark grayish-brown, SILT & CLAY, some Sand, trace Gravel, plastic, cohesive, moist. Changing at 95.7 feet to: NO RECOVERY. | 94' SILT & CLAY; 95.7' NO RECOVERY | | |
| 95 | | | | | | | | | |
| 96 | 49 | 24/24 | 96-98 | 9-27 31-33 | ND | Dark grayish-brown to dark gray, SILT & CLAY, some Sand, trace Gravel, moderately plastic, cohesive, moist; very thin Sand, seam at 98.9 feet. | 96' SILT & CLAY | | |
| 97 | | | | | | | | | |
| 98 | 50 | 24/20.4 | 98-100 | 8-28-47 | ND | Dark grayish-brown to dark gray, SILT & CLAY, some Sand, trace Gravel, moderately plastic, cohesive, moist; very thin Sand, seam at 98.9 feet. Changing at 99.7 feet to: NO RECOVERY. | 99.7' NO RECOVERY | | |
| 99 | | | | | | | | | |
| 100 | 51 | 24/24 | 100-102 | 8-22 29-36 | ND | Dark grayish-brown to dark gray, SILT & CLAY, some Sand, trace Gravel, moderately plastic, cohesive, moist. | 100' SILT & CLAY | | |
| 101 | | | | | | | | | |
| 102 | 52 | 24/20.4 | 102-104 | 13-31 46-50/5" | ND | Dark grayish-brown to dark gray, SILT & CLAY, some Sand, trace Gravel, moderately plastic, cohesive, moist. Changing at 103.3 feet to: Brown, fine to medium grained SAND, trace Silt, wet. Changing at 103.7 feet to: NO RECOVERY. | 103.3' | | |
| 103 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 10 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND 103.7' | | |
| 104 | 53 | 24/6 | 104-106 | 50/5.5" | ND | Dark gray, GRAVEL, some fine to coarse grained SAND, trace Silt, wet. Changing at 104.5 feet to: NO RECOVERY. | NO 104' RECOVERY GRAVEL 104.5' NO RECOVERY | | |
| 105 | | | | | | | | | |
| 106 | 54 | 24/13.2 | 106-108 | 1-2 6-15 | ND | Dark grayish-brown, GRAVEL, some fine to coarse grained Sand, trace Silt, wet. Changing at 107.1 feet to: NO RECOVERY. | 106' GRAVEL 107.1' NO RECOVERY | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24/6 | 108-110 | 2-2 6-9 | ND | Dark grayish-brown, GRAVEL, some fine to coarse grained Sand, trace Silt, wet. Changing at 108.5 feet to: NO RECOVERY. | 108' GRAVEL 108.5' NO RECOVERY | | |
| 109 | | | | | | | | | |
| 110 | 56 | 24/15.6 | 110-112 | 14-15 | ND | Dark grayish-brown, GRAVEL, some fine to coarse grained Sand, trace Silt, wet. Changing at 111.3 feet to: NO RECOVERY. | 110' GRAVEL 111.3' NO RECOVERY | | |
| 111 | | | | | | | | | |
| 112 | 57 | 24 | 112-114 | | | No sampling attempts. | 112' NO SAMPLING ATTEMPTS | | |
| 113 | | | | | | | | | |
| 114 | 58 | 24 | 114-116 | | | No sampling attempts. | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 11 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NO SAMPLING ATTEMPTS | | |
| 116 | 59 | 24 | 116-118 | | | No sampling attempts. | | | |
| 117 | | | | | | | | | |
| 118 | 60 | 24 | 118-120 | | | No sampling attempts. | | | |
| 119 | | | | | | | | | |
| 120 | 61 | 24 | 120-122 | | | No sampling attempts. | | | |
| 121 | | | | | | | | | |
| 122 | 62 | 24 | 122-124 | | | No sampling attempts. | | | |
| 123 | | | | | | | | | |
| 124 | 63 | 24 | 124-126 | | | No sampling attempts. | | | |
| 125 | | | | | | | | | |
| 126 | 64 | 24 | 126-128 | | | No sampling attempts. | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 12 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 127 | | | | | | | NO SAMPLING ATTEMPTS | | |
| 128 | 65 | 24 | 128-130 | | | No sampling attempts. | | | |
| 129 | | | | | | | | | |
| 130 | 66 | 24 | 130-132 | | | No sampling attempts. | | | |
| 131 | | | | | | | | | |
| 132 | 67 | 24 | 132-134 | | | No sampling attempts. | | | |
| 133 | | | | | | | | | |
| 134 | 68 | 24 | 134-136 | | | No sampling attempts. | | | |
| 135 | | | | | | | | | |
| 136 | 69 | 24 | 136-138 | | | No sampling attempts. | | | |
| 137 | | | | | | | | | |
| 138 | 70 | 24 | 138-140 | | | No sampling attempts. | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 13 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | NO SAMPLING ATTEMPTS | | |
| 139 | | | | | | | | | |
| 140 | 71 | 24 | 140-142 | | | No sampling attempts. | | | |
| 141 | | | | | | | | | |
| 142 | 72 | 24 | 142-144 | | | No sampling attempts. | | | |
| 143 | | | | | | | | | |
| 144 | 73 | 24 | 144-146 | | | No sampling attempts. | | | |
| 145 | | | | | | | | | |
| 146 | 74 | 24 | 146-148 | | | No sampling attempts. | | | |
| 147 | | | | | | | | | |
| 148 | 75 | 24 | 148-150 | | | No sampling attempts. | | | |
| 149 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 14 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 76 | 24 | 150-152 | | | No sampling attempts. | NO SAMPLING ATTEMPTS | | |
| 151 | | | | | | | | | |
| 152 | 77 | 24 | 152-154 | | | No sampling attempts. | | | |
| 153 | | | | | | | | | |
| 154 | 78 | 24 | 154-156 | | | No sampling attempts. | | | |
| 155 | | | | | | | | | |
| 156 | 79 | 24 | 156-158 | | | No sampling attempts. | | | |
| 157 | | | | | | | | | |
| 158 | 80 | 24 | 158-160 | | | No sampling attempts. | | | |
| 159 | | | | | | | | | Filter Sand |
| 160 | 81 | 24 | 160-162 | | | No sampling attempts. | | | |
| 161 | | | | | | | | | 2-Inch PVC Well Screen |

**REMARKS**

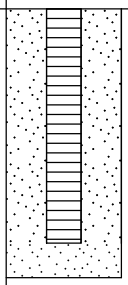
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** PMW-WV-11/MW-WV-11D
**Page:** 15 **of** 15
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 162 | 82 | 24 | 162-164 | | | No sampling attempts. | NO SAMPLING ATTEMPTS | |  |
| 163 | | | | | | | | | |
| 164 | 83 | 24/9.6 | 164-166 | 25-50/3 | ND | Dark grayish-brown, SILT, trace fine grained SAND, non-plastic, cohesive, moist. | 164' SILT | | |
| 165 | | | | | | | | | |
| 166 | | | | | | Bottom of Borehole at 166.0 Feet | 166' | 3 | |
| 167 | | | | | | | | | |
| 168 | | | | | | | | | |
| 169 | | | | | | | | | |
| 170 | | | | | | | | | |
| 171 | | | | | | | | | |
| 172 | | | | | | | | | |
| 173 | | | | | | | | | |

**REMARKS**

3. Monitoring well was installed in borehole upon completion. Well screen set from 158.9 to 163.7 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** PMW-WV-11/MW-WV-11D

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV11S
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:** Leslie Nelson

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry H., Travis & Zach/Gary
**Logged by:** John Morehouse
**Date Start/Finish:** 1-3-19 / 1-3-19
**Boring Location:**
**GS Elev.:** **Datum:** NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

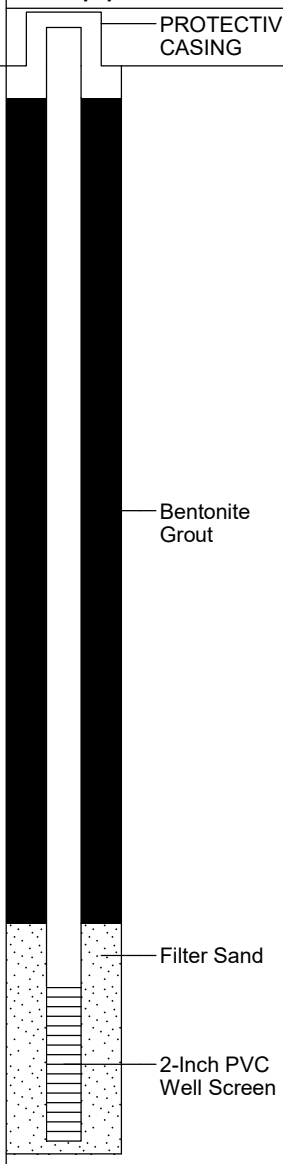
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–33 | | | | | | See boring log PMW-WV-11/MW-WV-11D for soil descriptions. | | |
| 34 | | | | | | Bottom of Borehole at 34.0 Feet | | 1 |
| 35 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 28.8 to 33.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 3/25/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 1 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry H.
**Logged by:** John Morehouse
**Date Start/Finish:** 10-26-18 / 11-29-18
**Boring Location:**
**GS Elev.:** **Datum:** MI State Plane S Zone NAD 83

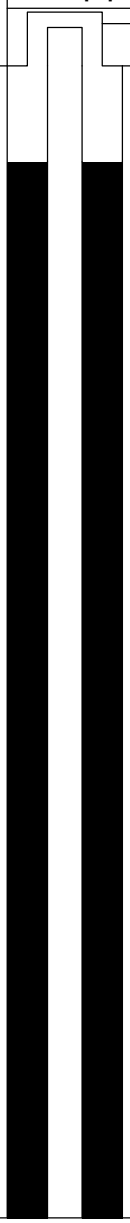
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24 | 0-2 | 3-3 3-3 | 0.0 ppm | Dark brown, poorly sorted, fine to medium-grained SAND, some Silt, trace Clay, trace Gravel, non to slightly plastic, slightly cohesive, moist. Changing at 1.6 feet to: NO RECOVERY. | SAND | 1 |
| 2 | 2 | 24 | 2-4 | 2-2 1-1 | 0.0 ppm | Dark brown, poorly sorted, fine to medium-grained SAND, some Silt, trace Clay, trace Gravel, non to slightly plastic, slightly cohesive, moist. Changing at 2.3 feet to: Dark yellowish-brown, poorly sorted, SILT, little Clay, trace Gravel, moderately plastic, cohesive, moist. Changing at 2.6 feet to: Dark yellowish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plstic, cohesive, moist. Changing at 2.8 feet to: NO RECOVERY. Dark yellowish-brown, poorly sorted, Silty CLAY, trce Gravel, plastic, cohesive, moist. Changing at 5.6 feet to: NO RECOVERY. | 1.6' NO RECOVERY 2' SAND 2.3' SILT 2.6' CLAY & SILT 2.8' NO RECOVERY 4' Silty CLAY 5.6' NO RECOVERY 6' | |
| 3 | 3 | 24 | 4-6 | 0-0 1-2 | 0.0 ppm | | | |
| 6 | 4 | 24 | 6-8 | 0-1 5-6 | 0.0 ppm | Dark yellowish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 7.6 feet to: Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist. Changing 7.8 feet to: NO RECOVERY. | Silty CLAY 7.6' 7.8' SAND 8' NO RECOVERY | |
| 8 | 5 | 24 | 8-10 | 4-7 9-8 | 0.0 ppm | Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist. Changing at 8.6 feet to: Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist. Changing at 9.5 feet to: NO RECOVERY. Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist. Changing at 11.5 feet to: NO RECOVERY. | SAND 9.5' NO RECOVERY 10' SAND 11.5' NO RECOVERY 12' | |
| 10 | 6 | 24 | 10-12 | 5-8 8-10 | 0.0 ppm | | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 2 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 7 | 24 | 12-14 | 2-7 13-24 | 0.0 ppm | Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist. Changing at 13.0 feet to: Yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Gravel, little Silt, slightly cohesive, moist. Changing at 13.9 feet to: NO RECOVERY. | SAND | | |
| 13 | | | | | 0.0 ppm | | | | |
| 14 | 8 | 24 | 14-16 | 14-11 10-14 | 0.0 ppm | Yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Gravel, little Silt, slightly cohesive, moist. Changing at 14.5 feet to: Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist. Changing at 15.7 feet to: NO RECOVERY. | 13.9' 14' NO RECOVERY SAND | | |
| 15 | | | | | | | 15.7' 16' NO RECOVERY Silty CLAY | | |
| 16 | 9 | 24 | 16-18 | 6-8 9-13 | 0.0 ppm | Dark gray, poorly sorted, Silty CLAY, plastic, cohesive, moist. Changing at 17.8 feet to: NO RECOVERY. | | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24 | 18-20 | 6-10 11-16 | 0.0 ppm | Brown, moderately well sorted, fine to medium-grained SAND, little Silt, moist to wet. Changing at 18.3 feet to: Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist with occasional fine Sand partings. Changing at 18.8 feet to: Brown, moderately well sorted, fine to medium-grained SAND, little Silt, moist to wet. Changing at 18.9 feet to: Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist with occasional fine Sand partings. Changing at 19.8 feet to: NO RECOVERY. | 17.8' 18' NO RECOVERY SAND | 2 | |
| 19 | | | | | | | | | |
| 20 | 11 | 24 | 20-22 | 2-6 10-16 | 0.0 ppm | | 19.8' 20' NO RECOVERY. SAND | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24 | 22-24 | 6-8 12-10 | 0.0 ppm | Brown, moderately well sorted, fine to medium-grained SAND, little Silt, moist to wet. Changing at 20.4 feet to: Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist with occasional fine Sand, partings. Changing at 20.8 feet to: Brown, moderately well sorted, fine to medium-grained SAND, little Silt, moist to wet. Changing at 20.9 feet to: Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist with occasional fine Sand partings. Changing at 21.4 feet to: Brown, | 21.8' 22' NO RECOVERY Silty CLAY | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24 | 24-26 | 4-8 12-15 | 0.0 ppm | | 23.7' 24' NO RECOVERY Silty CLAY | | |
| 25 | | | | | | | | | |

**REMARKS**

2. Groundwater was encountered at approximately 18.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 3 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24 | 26-28 | 6-13 15-16 | 0.0 ppm | moderately well sorted, fine to medium-grained SAND, little Silt, moist to wet. Changing at 21.5 feet to: Yellowish-brown, poorly sorted, fine to medium-grained SAND, little Silt, little Clay, trace Gravel, slightly plastic, slightly cohesive, moist with occasional fine Sand partings. Changing at 21.8 feet to: NO RECOVERY. | Silty CLAY<br>27'<br>27.2' SAND<br>Silty CLAY<br>27.8' | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24 | 28-30 | 5-7 10-14 | 0.0 ppm | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 23.7 feet to: NO RECOVERY. | 28' NO RECOVERY<br>Silty CLAY | | |
| 29 | | | | | | Dark grayish-brown, well sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist with fine Sand partings at 24.7 feet. Changing at 25.4 feet to: Dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist with fine Sand partings at 25.4 feet and 25.7 feet. | | | |
| 30 | 16 | 24 | 30-32 | 5-7 11-16 | 0.0 ppm | | | | |
| 31 | | | | | | Dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist with fine Sand partings at 26.7 feet. Changing at 27.0 feet to: Brown, very well sorted, fine-grained SAND, trace Silt, moist. Changing at 27.2 feet to: Dark grayish-brown, poorly sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist with fine Sand partings at 27.4 feet. Changing at 27.8 feet to: NO RECOVERY. | 31.9' | | |
| 32 | 17 | 24 | 32-34 | 4-9 11-17 | 0.0 ppm | | 32' NO RECOVERY<br>Silty CLAY | | |
| 33 | | | | | | Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. | | | |
| 34 | 18 | 24 | 34-36 | 5-11 13-13 | 0.0 ppm | Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 31.9 feet to: NO RECOVERY. Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. | | | |
| 35 | | | | | | Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. | | | |
| 36 | 19 | 24 | 36-38 | 3-7 12-12 | 0.0 ppm | Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24 | 38-40 | 3-8 11-13 | 0.0 ppm | Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. | 38'<br>CLAY & SILT | | |
| 39 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 4 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 21 | 24 | 40-42 | 3-7 89-10 | 0.0 ppm | Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 41.2 feet to: Dark gray, poorly sorted, SILT & CLAY, some Sand, trace Gravel, moderately plastic, cohesive, moist. Changing at 41.4 feet to: Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist with occasional fine Sand partings. | CLAY & SILT<br>41.2'<br>41.4' SILT & CLAY<br>Silty CLAY<br>42' | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24 | 42-44 | 3-8 10-13 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, trace Gravel, plastic, cohesive, moist. Changing at 43.6 feet to: Dark gray, well sorted, Silty CLAY, plastic, coesive, moist. Changing at 43.9 feet to: Dark grayish-brown, poorly sorted, CLAY & SILT, trace Gravel, plastic, cohesive, moist. | CLAY & SILT<br>43.6'<br>43.9' Silty CLAY | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24 | 44-46 | 2-8 12-12 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, trace Gravel, plastic, cohesive, moist. Changing at 44.9 feet to: Dark grayish-brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, slightly plastic, cohesive, moist. Changing at 45.8 feet to: NO RECOVERY. | CLAY & SILT<br>44.9'<br>SILT & CLAY<br>45.8' | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24 | 46-48 | 4-6 11-16 | 0.0 ppm | Dark grayish-brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, slightly plastic, cohesive, moist. Changing at 46.2 feet to: Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 47.8 feet to: NO RECOVERY. | 46' NO RECOVERY<br>46.2'<br>SILT & CLAY<br>Silty CLAY<br>47.8' | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24 | 48-50 | 3-7 14-23 | 0.0 ppm | Dark gray, well sorted, Silty CLAY, plastic, cohesive, moist with fine Sand parting at 48.6 feet. Changing at 49.8 feet to: Brown, well sorted, fine to medium -grained SAND, trace Silt, moist to wetl. Changing at 49.9 feet to: NO RECOVERY. | 48' NO RECOVERY<br>Silty CLAY<br>49.8' | | |
| 49 | | | | | | | | | |
| 50 | 26 | 24 | 50-52 | 2-9 14-22 | 0.0 ppm | Grayish-brown to brown, poorly sorted, fine to coarse-grained SAND, trace Gravel, trace Silt, wet. Changing at 50.7 feet to: Dark gray, very well sorted, fine-grained SAND, some Silt, wet. Changing at 51.0 feet to: Dark yellowish-brown, moderately sorted, fine-grained SAND, some Silt, trace Clay, slightly plastic, cohesive, wet. Changing at 51.3 feet to: Yellowish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 51.5 feet to: NO RECOVERY. | 49.9' SAND<br>50' NO RECOVERY<br>SAND<br>51.5' | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24 | 52-54 | 10-15 17-27 | 0.0 ppm | | NO RECOVERY<br>52'<br>SAND<br>52.8' | | |
| 53 | | | | | | Yellowish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 52.8 feet to: Dark grayish-brown, very well sorted, SILT, trace | SILT<br>53.7'<br>54' NO | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 5 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 28 | 24 | 54-56 | 13-17 17-32 | 0.0 ppm | Clay, slightly plastic, cohesive, moist. Changing at 53.7 feet to: NO RECOVERY. Dark grayish-brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, moderately plastic, cohesive, moist. Changing at 55.2 feet to: Dark grayish-brown to grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 55.4 feet to: Varved dark grayish-brown, very well sorted, Silty CLAY & SILT, plastic, cohesive, moist. Changing at 55.9 feet to: Dark gray, poorly sorted, CLAY & SILT, trace Gravel, plastic, cohesive, moist. | RECOVERY SILT & CLAY | | |
| 55 | | | | | | | 55.2' | | |
| | | | | | | | 55.4' SAND | | |
| | | | | | | | CLAY & SILT | | |
| 56 | 29 | 24 | 56-58 | 3-13 16-20 | 0.0 ppm | | 56' SILT | | |
| 57 | | | | | | Dark grayish-brown to brown, well sorted, SILT with very thin Clay varves, plastic (Clay), cohesive, moist to wet. Changing at 57.7 feet to: NO RECOVERY. Dark grayish-brown, moderately sorted, CLAY & SILT, trace fine-grained Sand, plastic, cohesive, moist. Changing at 59.0 feet to: Dark gray to dark grayish-brown, moderately well sorted, fine to medium SAND, little Silt, moist to wet. Changing at 59.3 feet to: Dark grayish-brown, moderately sorted, CLAY & SILT, trace fine-grained Sand, plastic, cohesive, moist. Changing at 59.6 feet to: NO RECOVERY. Varved dark grayish-brown, well sorted, Silty CLAY and fine SAND, plastic, cohesive, moist to wet. Changing at 61.1 feet to: Dark grayish-brown, moderately well sorted, Silty CLAY, trace Gravel, plastic, cohesive, moist with occasional fine Sand partings. Changing at 61.7 feet to: NO RECOVERY. Varved dark grayish-brown, well sorted, Silty CLAY and fine-grained SAND, plastic, cohesive, moist to wet with fine Sand partings from 62.0 to 63.0 feet. Changing at 63.0 feet to: Dark grayish-brown, poorly sorted, CLAY & SILT, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 63.6 feet to: NO RECOVERY. Dark grayish-brown, poorly sorted, CLAY & SILT, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 64.6 feet to: Dark grayish-brown, well sorted, fine to medium SAND, trace Silt, wet. Changing at 64.7 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 65.1 feet to: Dark grayish-brown, moderately well sorted, fine to medium-grained SAND, little Clay, little Silt, slightly plastic, moist to wet. Changing at 65.3 feet to: Dark grayish-brown, moderately sorted, CLAY & SILT, trace Gravel, trace Sand, plastic, cohesive, moist. Changing at 65.6 feet to: NO RECOVERY. | 57.7' | | |
| 58 | 30 | 24 | 58-60 | 3-13 21-47 | 0.0 ppm | | 58' NO RECOVREY | | |
| | | | | | | | CLAY & SILT | | |
| 59 | | | | | | | 59' | | |
| | | | | | | | 59.3' SAND | | |
| | | | | | | | 59.6' CLAY & SILT | | |
| | | | | | | | 60' NO RECOVERY | | |
| 60 | 31 | 24 | 60-62 | 3-10 15-37 | 0.0 ppm | | Silty CLAY and SAND | | |
| 61 | | | | | | | 61.1' Silty CLAY | | |
| | | | | | | | 61.7' | | |
| 62 | 32 | 24 | 62-64 | 5-10 12-44 | 0.0 ppm | | 62' NO RECOVERY | | |
| | | | | | | | Silty CLAY and SAND | | |
| 63 | | | | | | | 63' CLAY & SILT | | |
| | | | | | | | 63.6' | | |
| 64 | 33 | 24 | 64-66 | 6-12 16-34 | 0.0 ppm | | 64' NO RECOVERY | | |
| | | | | | | | CLAY & SILT | | |
| | | | | | | | 64.6' | | |
| | | | | | | | 64.7' SAND | | |
| 65 | | | | | | | 65.1' Silty CLAY | | |
| | | | | | | | 65.3' SAND | | |
| | | | | | | | 65.6' CLAY & SILT | | |
| | | | | | | | 66' NO RECOVERY | | |
| 66 | 34 | 24 | 66-68 | 7-17 22-45 | 0.0 ppm | | Silty CLAY and SAND | | |
| 67 | | | | | | | 67.9' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 6 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 35 | 24 | 68-70 | 3-4 12-25 | 0.0 ppm | Varved dark grayish-brown, well sorted, Silty CLAY and fine-grained SAND, plastic, cohesive, moist. Changing at 67.9 feet to: Brown, moderately well sorted, fine to coarse-grained SAND, little Silt, grace Gravel, moist to wet. | 68' SAND; 68.5' Silty CLAY; SAND; 69' | | |
| 69 | | | | | | | 69.2' Silty CLAY; NO RECOVERY; 70' | | |
| 70 | 36 | 24 | 70-72 | 6-13-50/6" | 0.0 ppm | Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 68.5 feet to: Brown, well sorted, fine to medium-grained SAND, trace Silt, moist to wet. Changing at 69.0 feet to: Varved dark grayish-brown, well sorted, Silty CLAY and fine-grained SAND, plastic, cohesive, moist. Changing at 69.1 feet to: Varved dark grayish-brown, well sorted, Silty CLAY and SILT, plastic, cohesive, moist. Changing at 69.2 feet to: NO RECOVERY. | CLAY & SILT; 71' | | |
| 71 | | | | | | | Silty CLAY; 71.4'; 71.6' SAND; 71.8' Silty CLAY | | |
| 72 | 37 | 24 | 72-74 | 2-7 17-40 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, trace Gravel, plastic, cohesive, moist. Grading to 71.0 feet: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 71.4 feet to: Brown, very well sorted, fine to medium-grained SAND, trace Silt, moist to wet. Changing at 71.6 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 71.8 feet to: Brown, very well sorted, fine to medium SAND, trace Silt, moist to wet. | SAND; 73.5' | | |
| 73 | | | | | | | NO RECOVERY; 74' | | |
| 74 | 38 | 24 | 74-76 | 1-10 33-50 | 0.0 ppm | | SAND; 74.5' | | |
| 75 | | | | | | Brown, very well sorted, fine to medium SAND, trace Silt, moist to wet. Changing at 73.5 feet to: NO RECOVERY. | NO RECOVERY; 76' | | |
| 76 | 39 | 24 | 76-78 | 1-4 16-26 | 0.0 ppm | Brown, very well sorted, fine to medium-grained SAND, trace Silt, moist to wet. Changing at 74.5 feet to: NO RECOVERY. | SAND; 76.3' | | |
| 77 | | | | | | Brown, very well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 76.3 feet to: NO RECOVERY. | NO RECOVERY; 78' | | |
| 78 | 40 | 24 | 78-80 | 5-22 31-38 | 0.0 ppm | Brown, very well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at Changing at 79.6 feet to: NO RECOVERY. | SAND; 79.6' | | |
| 79 | | | | | | | NO RECOVERY; 80' | | |
| 80 | 41 | 24 | 80-82 | 1-11 14-43 | 0.0 ppm | Brown, very well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 81.6 feet to: NO RECOVERY. | SAND; 81.6' | | |
| 81 | | | | | | | NO RECOVERY; 82' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 7 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 42 | 24 | 82-84 | 10-26 40-50 | 0.0 ppm | Brown, very well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 83.3 feet to: NO RECOVERY. | SAND | | |
| 83 | | | | | | | 83.3' NO RECOVERY | | |
| 84 | 43 | 24 | 84-86 | 4-10 17-20 | 0.0 ppm | Brown, very well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 85.2 feet to: Dark grayish-brown poorly sorted, SAND, little Clay, little Silt, slightly plastic, moderately cohesive, moist. Changing at 85.2 feet to: NO RECOVERY. | 84' SAND | | |
| 85 | | | | | | | 85.3' NO RECOVERY | | |
| 86 | 44 | 24 | 86-88 | 15-28 33-50/4.5" | 0.0 ppm | Dark grayish-brown, poorly sorted SAND, some Silt, trace Clay, slightly plastic, moderately cohesive, moist. Changing at 87.4 feet to: NO RECOVERY. | 86' SAND | | |
| 87 | | | | | | | 87.4' NO RECOVERY | | Bentonite Grout |
| 88 | 45 | 24 | 88-90 | 11-21 20-25 | 0.0 ppm | Dark grayish-brown, poorly sorted SAND, some Silt, trace Clay, trace Gravel, slightly plastic, moderately cohesive, moist. Changing at 88.9 feet to: Dark grayish-brown, poorly sorted, CLAY & SILT, some Sand, slightly plastic, cohesive, moist. Changing at 89.2 feet to: NO RECOVERY. | 88' SAND | | |
| 89 | | | | | | | 88.9' CLAY & SILT 89.2' NO RECOVERY | | |
| 90 | 46 | 24 | 90-92 | 14-23 19-22 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, some Sand, slightly plastic, cohesive, moist. Changing at 90.6 feet to: Dark grayish-brown, well sorted, SILT, non plastic, moderately cohesive, moist to wet. Changing at 91.5 feet to: Dark grayish-brown to dark gray, poorly sorted, SILT & CLAY, trace Gravel, plastic, cohesive, moist. Changing at 91.9 feet to: NO RECOVERY. | 90' CLAY & SILT | | |
| 91 | | | | | | | 90.6' SILT 91.5' SILT & CLAY | | |
| 92 | 47 | 24 | 92-94 | 9-31-50/6" | 0.0 ppm | Dark grayish-brown to dark gray, poorly sorted, SILT & CLAY, trace Gravel, plastic, cohesive, moist. Changing at 93.1 feet to: Varved dark grayish-brown, well sorted, Silty CLAY and Silt, plastic, cohesive, moist. Changing at 93.2 feet to: NO RECOVERY. | 91.9' 92' NO RECOVERY SILT & CLAY | | |
| 93 | | | | | | | 93.1' 93.2' CLAY & SILT NO RECOVERY | | |
| 94 | 48 | 24 | 94-96 | 31-50/4.5" | 0.0 ppm | Varved dark grayish-brown, well sorted, Silty CLAY and Silt, plastic, cohesive, moist. Changing at 95.3 feet to: NO RECOVERY. | 94' CLAY & SILT | | |
| 95 | | | | | | | 95.3' NO RECOVERY 96' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 8 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 49 | 24 | 96-98 | 25-48-50/4 | 0.0 ppm 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, some Sand, trace Gravel, plastic, cohesive, moist. Changing at 97.2 feet to: NO RECOVERY. | CLAY & SILT 97.2' NO RECOVERY 98' | | |
| 97 | | | | | | | | | |
| 98 | 50 | 24 | 98-100 | 27-50/5.5" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, some Sand, trace Gravel, plastic, cohesive, moist. Changing at 98.3 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 98.9 feet to: NO RECOVERY. | CLAY & SILT 98.3' Silty CLAY 98.9' NO RECOVERY 100' | | |
| 99 | | | | | | | | | |
| 100 | 51 | 24 | 100-102 | 8-23 37-32 | 0.0 ppm | Brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 100.5 feet to: Brown, very well sorted, SILT, trace Clay, slightly plastic, cohesive, varved with very thin layers of Silty CLAY, moist. Changing at 101.2 feet to: NO RECOVERY. | SAND 100.5' SILT 101.2' NO RECOVERY 102' | | |
| 101 | | | | | | | | | |
| 102 | 52 | 24 | 102-104 | 27-28 44-45 | 0.0 ppm | Light grayish-brown to pale brown, very well sorted, SILt, cohesive, moist. Changing at 102.2 feet to: Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 103.2 feet to: NO RECOVERY. | 102.2' SILT CLAY & SILT 103.2' NO RECOVERY 104' | | |
| 103 | | | | | | | | | |
| 104 | 53 | 24 | 104-106 | 11-27-50/5 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 105.4 feet to: NO RECOVERY. | CLAY & SILT 105.4' NO RECOVERY 106' | | |
| 105 | | | | | | | | | |
| 106 | 54 | 24 | 106-108 | 31-50/5.5" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 107.4 feet to: NO RECOVERY. | CLAY & SILT 107.4' NO RECOVERY 108' | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24 | 108-110 | 26-50/4" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 108.8 feet to: NO RECOVERY. | CLAY & SILT 108.8' NO RECOVERY 110' | | |
| 109 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 9 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 56 | 24 | 110-112 | 11-22 37-50/5" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 111.9 feet to: NO RECOVERY. | CLAY & SILT | | |
| 111 | | | | | | | | | |
| 112 | 57 | 24 | 112-114 | 31-50/3.5" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 112.7 feet to: NO RECOVERY. | 111.9' 112' NO RECOVERY CLAY & SILT 112.6' 112.7' SAND NO RECOVERY | | |
| 113 | | | | | | | | | |
| 114 | 58 | 24 | 114-116 | 18-38-50 | 0.0 ppm | Dark grayish-brown, very well sorted, SILT, trace Clay, slightly plastic, cohesive, varved with very thin layers of Silty CLAY, moist. Changing at 114.7 feet to: Dark grayish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 114.8 feet to: Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 115.5 feet to: NO RECOVERY. | 114' SILT 114.7' 114.8' SAND CLAY & SILT 115.5' NO RECOVERY | | |
| 115 | | | | | | | | | |
| 116 | 59 | 24 | 116-118 | 4-13 25-50 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 116.4 feet to: Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 117.8 feet to: NO RECOVERY. | 116' CLAY & SILT | | |
| 117 | | | | | | | | | |
| 118 | 60 | 24 | 118-120 | 5-27 34-39 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. | 117.8' 118' NO RECOVERY CLAY & SILT | | |
| 119 | | | | | | | | | |
| 120 | 61 | 24 | 120-122 | 12-20 28-45 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 121.9 feet to: NO RECOVERY. | | | |
| 121 | | | | | | | | | |
| 122 | 62 | 24 | 122-124 | 17-23 46-50/3.5" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 123.5 feet to: Dark grayish-brown, very well sorted, SILT, trace Clay, slightly plastic, cohesive, varved with very thin layers of Silty CLAY, moist. Changing at 123.8 feet to: NO RECOVERY. | 121.9' 122' NO RECOVERY CLAY & SILT 123.5' 123.8' SILT 124' NO | | |
| 123 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 10 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 24 | 124-126 | 8-24 44-50/4" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 125.8 feet to: NO RECOVERY. | RECOVERY CLAY & SILT | | |
| 125 | | | | | | | | | |
| 126 | 64 | 24 | 126-128 | 10-25 47-50/4" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 127.8 feet to: NO RECOVERY. | 125.8' 126' NO RECOVERY CLAY & SILT | | |
| 127 | | | | | | | | | |
| 128 | 65 | 24 | 128-130 | 27-34-50/5 | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 129.4 feet to: NO RECOVERY. | 127.8' 128' NO RECOVERY CLAY & SILT | | |
| 129 | | | | | | | | | |
| 130 | 66 | 24 | 130-132 | 9-21 35-50/5" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand trace Gravel, plastic, cohesive, moist. Changing at 131.9 feet to: NO RECOVERY. | 129.4' NO RECOVERY 130' CLAY & SILT | | |
| 131 | | | | | | | | | |
| 132 | 67 | 24 | 132-134 | 7-9 10-17 | 0.0 ppm | Dark grayish-brown poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 132.8 feet to: Dark grayish-brown, very well sorted, SILT, non plastic, cohesive, moist. Changing at 133.1 feet to: Dark grayish-brown, well sorted, Silty CLAY, plastic, cohesive, moist. Changing at 133.4 feet to: Dark grayish-brown, well sorted, SILT, some fine-grained SAND, non plastic, cohesive, moist to wet. Changing at 133.8 feet to: NO RECOVERY. | 131.9' 132' NO RECOVERY CLAY & SILT 132.8' SILT 133.1' Silty CLAY 133.4' SILT 133.8' NO RECOVERY | | |
| 133 | | | | | | | | | |
| 134 | 68 | 24 | 134-136 | 19-33-50/4 | 0.0 ppm | | 134' NO RECOVERY CLAY & SILT 134.3' SILT 134.8' SILT & CLAY (CL) | | |
| 135 | | | | | | Dark grayish-brown, poorly sorted, CLAY & SILT, little Sand, trace Gravel, plastic, cohesive, moist. Changing at 134.3 feet to: Dark grayish-brown, very well sorted, SILT, non plastic, cohesive, moist. Changing at 134.6 feet to: Dark grayish-brown, moderately sorted, SILt, little Clay, slightly plastic, cohesive, moist. Changing at 134.8 feet to: Dark grayish-brown, very well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 135.4 feet to: NO RECOVERY. | | | |
| 136 | 69 | 24 | 136-138 | 50/4.5" | 0.0 ppm | Dark grayish-brown, well sorted, | | | |
| 137 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 11 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 70 | 24 | 138-140 | 30-50/2" | 0.0 ppm | fine-grained SAND with layers of well sorted, Silty CLAY, moist. Chaging at 136.4 feet to: NO RECOVERY. | SILT & CLAY (CL) 138.6' NO RECOVERY | | |
| 139 | | | | | | Dark grayish-brown, well sorted, fine-grained SAND with layers of well sorted Silty CLAY, moist. Changing at 138.4 feet to: Dark grayish-brown, poorly sorted, SILT & CLAY, little Sand, trace Gravel, slightly plastic, cohesive, moist. Changing at 138.6 feet to: NO RECOVERY. | 140' | | |
| 140 | 71 | 24 | 140-142 | 2-1 4-8 | 0.0 ppm | | SILT & CLAY 140.8' | | |
| 141 | | | | | | Varved dark grayish-brown, well sorted, SILT and Silty CLAY, plastic, cohesive, moist. Changing at 140.8 feet to: NO RECOVERY. | NO RECOVERY 142' | | |
| 142 | 72 | 24 | 142-144 | 7-19 35-50/3.5" | 0.0 ppm | Dark grayish-brown to dark brown, poorly sorted, coarse-grained SAND, some Gravel, trace Silt, moist to wet. Changing at 142.3 feet to: Dark grayish-brown to dark brown, poorly sorted, fine to coarse-grained SAND, little Gravel, trace Silt, moist to wet. Changing at 143.0 feet to: NO RECOVERY. | SAND 143' | | |
| 143 | | | | | | | NO RECOVERY 144' | | |
| 144 | 73 | 24 | 144-146 | 41-50 | 0.0 ppm | Brown to dark gray, poorly sorted, GRAVEL with coarse-grained SAND, little Silt, wet. Changing at 144.7 feet to: NO RECOVERY. | GRAVEL 144.7' | | |
| 145 | | | | | | | NO RECOVERY 146' | | |
| 146 | 74 | 24 | 146-148 | 18-50/5" | 0.0 ppm | Brown to dark gray, poorly sorted, GRAVEL with coarse-grained SAND, little Silt, wet. Changing at 146.9 feet to: NO RECOVERY. | GRAVEL 146.9' | | |
| 147 | | | | | | | NO RECOVERY 148' | | |
| 148 | 75 | 24 | 148-150 | 38-50/5" | 0.0 ppm | Brown to dark gray, poorly sorted, GRAVEL with coarse-grained SAND, little Silt, wet. Changing at 148.9 feet to: NO RECOVERY. | GRAVEL 148.9' | | |
| 149 | | | | | | | NO RECOVERY 150' | | |
| 150 | 76 | 24 | 150-152 | 50/5" | 0.0 ppm | Brown to dark gray, poorly sorted, GRAVEL with coarse-grained SAND, little Silt, wet. Changing at 150.4 feet to: NO RECOVERY. | GRAVEL 150.4' | | |
| 151 | | | | | | | NO RECOVERY 152' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 12 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 77 | 24 | 152-154 | 30-50/3" | 0.0 ppm | Brown to dark gray, poorly sorted, GRAVEL with coarse-grained SAND, little Silt, moderately cohesive, moist to wet. Changing at 152.4 feet to: Very dark gray, poorly sorted, GRAVEL, some Silt, little Sand, trace Clay, non to slightly plastic, cohesive, moist. Changing at 152.5 feet to: Dark yellowish-brown, moderately sorted, coarse to medium-grained SAND, some Gravel, little Silt, moist. Changing at 152.7 feet to: NO RECOVERY. | GRAVEL 152.5' | | |
| 153 | | | | | | | 152.7' SAND NO RECOVERY | | |
| 154 | 78 | 24 | 154-156 | 50/4" | 0.0 ppm | Dark yellowish-brown, moderately sorted, coarse to medium-grained SAND, some Gravel, little Silt, wet. Changing at 154.2 feet to: Dark yellowish-brown, poorly sorted, fine to coarse-grained, SAND, trace Silt, trace Gravel, wet. Changing at 154.5 feet to: NO RECOVERY. | 154' SAND 154.5' | | |
| 155 | | | | | | | NO RECOVERY | | |
| 156 | 79 | 24 | 156-158 | 50-50/3" | 0.0 ppm | Dark brown to dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, trace Silt, wet. Changing at 156.5 feet to: Dark brown, poorly sorted, GRAVEL, some medium to coarse-grained Sand, little Silt, slightly cohesive, moist to wet. Changing at 156.8 feet to: NO RECOVERY. | 156' SAND 156.5' | | |
| | | | | | | | 156.8' GRAVEL | | |
| 157 | | | | | | | NO RECOVERY | | |
| 158 | 80 | 24 | 158-160 | 20-50/6" | 0.0 ppm | Dark brown, poorly sorted, GRAVEL, some medium to coarse-grained SAND, little Silt, slightly cohesive, moist to wet. Changing at 159.0 feet to: NO RECOVERY. | 158' GRAVEL | | |
| 159 | | | | | | | 159' NO RECOVERY | | |
| 160 | 81 | 24 | 160-162 | 32-50/3" | 0.0 ppm | Dark brown, poorly sorted, GRAVEL, some medium to coarse-grained SAND, little Silt, slightly cohesive, moist to wet. Changing at 160.8 feet to: NO RECOVERY. | 160' GRAVEL 160.8' | | |
| 161 | | | | | | | NO RECOVERY | | |
| 162 | 82 | 24 | 162-164 | 50-64 | 0.0 ppm | Dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Silt, little Gravel, moist to wet. Changing at 162.8 feet to: NO RECOVERY. | 162' SAND 162.8' | | |
| 163 | | | | | | | NO RECOVERY | | |
| 164 | 83 | 24 | 164-166 | 40-50 | 0.0 ppm | Dark yellowish-brown to dark brown, moderately sorted, GRAVEL, some coarse-grained Sand, trace Silt, wet. Changing at 164.4 feet to: Dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Silt, little Gravel, moist to wet. Changing at 165.0 to NO RECOVERY. | 164' GRAVEL 164.4' | | |
| 165 | | | | | | | 165' SAND NO RECOVERY 166' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 13 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 84 | 24 | 166-168 | 47-50/4" | 0.0 ppm | Dark yellowish-brown to dark brown, moderately sorted, GRAVEL, some coarse-grained Sand, trace Silt, wet. Changing at 166.1 feet to: Dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, some silt, little Gravel, moist to wet. Changing at 166.7 feet to: Yellowish-brown, well sorted, fine to medium-grained SAND, trace Silt, wet. Changing at 166.8 feet to: NO RECOVERY. Dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Silt, little Gravel, moist to wet. Changing at 168.8 feet to: NO RECOVERY. | 166.1' GRAVEL SAND 166.8' NO RECOVERY | | |
| 167 | | | | | | | | | |
| 168 | 85 | 24 | 168-170 | 30-50/4" | 0.0 ppm | | 168' SAND 168.8' NO RECOVERY | | |
| 169 | | | | | | | | | |
| 170 | 86 | 24 | 170-172 | 21-50/4" | 0.0 ppm | Dark yellowish-brown, poorly sorted, fine to coarse-grained SAND, some Silt, little Gravel, moist to wet. Changing at 170.8 feet to: NO RECOVERY. | 170' SAND 170.8' NO RECOVERY | | |
| 171 | | | | | | | | | |
| 172 | 87 | 24 | 172-174 | 20-50/4" | 0.0 ppm | Dark yellowish-brown to dark brown, poorly sorted, GRAVEL, some Silt, little fine to coarse-grained Sand, wet. Changing at 172.9 feet to: NO RECOVERY. | 172' GRAVEL 172.9' NO RECOVERY | | |
| 173 | | | | | | | | | |
| 174 | 88 | 24 | 174-176 | 45-50/4.5" | 0.0 ppm | Dark yellowish-brown to dark brown, poorly sorted, GRAVEL, some Silt, little fine to coarse-grained Sand, wet. Changing at 174.9 feet to: NO RECOVERY. | 174' GRAVEL 174.9' NO RECOVERY | | Filter Sand |
| 175 | | | | | | | | | |
| 176 | 89 | 24 | 176-178 | 40-50/2" | 0.0 ppm | Dark yellowish-brown to dark brown, poorly sorted, GRAVEL, some Silt, little fine to coarse-grained Sand, wet. Changing at 176.6 feet to: NO RECOVERY. | 176' GRAVEL 176.6' NO RECOVERY | | |
| 177 | | | | | | | | | |
| 178 | 90 | 24 | 178-180 | 11-12 9-12 | 0.0 ppm | Dark yellowish-brown to dark brown, poorly sorted, GRAVEL, some Silt, little fine to coarse-grained Sand, wet. Changing at 178.9 feet to: NO RECOVERY. | 178' GRAVEL 178.9' NO RECOVERY 180' | | 2-Inch PVC Well Screen |
| 179 | | | | | | | | | |

**REMARKS**

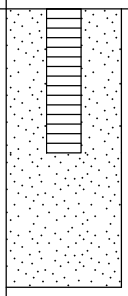
Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV12D
**Page:** 14 **of** 14
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 91 | 24 | 180-182 | 33-50/5" | 0.0 ppm | Dark yellowish-brown to dark brown, poorly sorted, GRAVEL, some Silt, little fine to coarse-grained Sand, wet. Changing at 180.8 feet to: NO RECOVERY. | GRAVEL<br>180.8'<br>No RECOVERY | |  |
| 181 | | | | | | | | | |
| 182 | 92 | 24 | 182-184 | 33-18<br>10-27 | 0.0 ppm | Dark yellowish-brown to dark brown, poorly sorted, GRAVEL, some Silt, little fine to coarse-grained Sand, wet. Changing at 182.9 feet to: Dark grayish-brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 183.3 feet to: NO RECOVERY. | 182'<br>GRAVEL<br>182.9'<br>CLAY & SILT<br>183.3'<br>NO RECOVERY<br>184' | | |
| 183 | | | | | | | | | |
| 184 | 93 | 24 | 184-186 | 21-33-50/3" | 0.0 ppm | Dark grayish-brown, poorly sorted, CLAY & SILT, trace Sand, trace Gravel, plastic, cohesive, moist. Changing at 185.0 feet to: NO RECOVERY. | CLAY & SILT<br>185'<br>NO RECOVERY<br>186' | | |
| 185 | | | | | | | | | |
| 186 | | | | | | Bottom of Borehole at 186.0 Feet | | 3 | |
| 187 | | | | | | | | | |
| 188 | | | | | | | | | |
| 189 | | | | | | | | | |
| 190 | | | | | | | | | |
| 191 | | | | | | | | | |
| 192 | | | | | | | | | |
| 193 | | | | | | | | | |

**REMARKS**

3. Monitoring well was installed in borehole upon completion. Well screen set from 176.6 to 181.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV12D

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-12M
**Page:** 1 **of** 3
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry H.
**Logged by:** John Morehouse
**Date Start/Finish:** 12-5-18 / 12-5-18
**Boring Location:**
**GS Elev.:** **Datum:** MI State Plane S Zone NAD 83

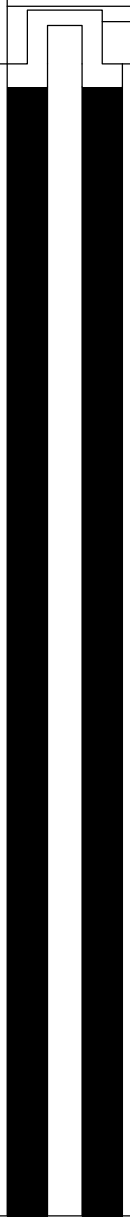
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Direct Push | MacroCore |
| **O.D. / I.D.:** | NA | 2.25" |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See boring log PMW-WV-12/MW-WV-12D for soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |

**Equipment Installed**



PROTECTIVE CASING

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-12M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-12M
**Page:** 2 **of** 3
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information | | | | | | | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | Bentonite Grout |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-12M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-12M
**Page:** 3 **of** 3
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 109–149 | | | | | | | | | Filter Sand; 2-Inch PVC Well Screen |
| 150 | | | | | | Bottom of Borehole at 150.0 Feet | | 1 | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 144.5 to 149.4 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-12M

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-12S
**Page:** 1 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry H.
**Logged by:** John Morehouse
**Date Start/Finish:** 12-6-18 / 12-5-18
**Boring Location:**
**GS Elev.:** **Datum:** MI State Plane S Zone NAD 83

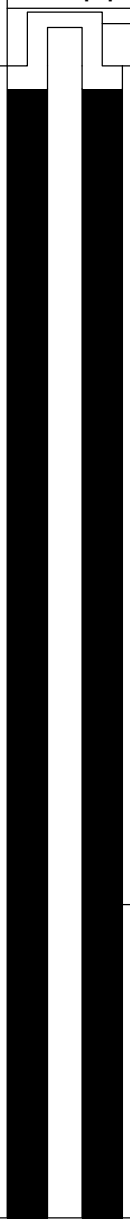
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Direct Push | MacroCore |
| **O.D. / I.D.:** | NA | 2.25" |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See boring log PMW-WV-12/MW-WV-12D for soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |
| 30 | | | | | | | | |
| 31 | | | | | | | | |
| 32 | | | | | | | | |
| 33 | | | | | | | | |
| 34 | | | | | | | | |
| 35 | | | | | | | | |
| 36 | | | | | | | | |
| 37 | | | | | | | | |
| 38 | | | | | | | | |
| 39 | | | | | | | | |
| 40 | | | | | | | | |
| 41 | | | | | | | | |
| 42 | | | | | | | | |
| 43 | | | | | | | | |
| 44 | | | | | | | | |
| 45 | | | | | | | | |
| 46 | | | | | | | | |
| 47 | | | | | | | | |
| 48 | | | | | | | | |
| 49 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-12S

BORING_WI 6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-12S
**Page:** 2 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 51–79 | | | | | | | | | Filter Sand; 2-Inch PVC Well Screen |
| 80 | | | | | | Bottom of Borehole at 80.0 Feet | | 1 | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 74.6 to 79.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-12S

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-13D
**Page:** 1 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Zach/Travis
**Logged by:** C. Melby
**Date Start/Finish:** 2-14-19 / 2-18-19
**Boring Location:**
**GS Elev.:** **Datum:** MI State Plane S Zone NAD 83

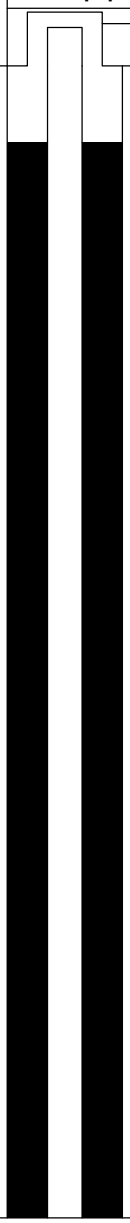
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24/8 | 0-2 | WOH 12"-1-1 | | Very soft, light brown, Clayey SILT, little Organic Matter, Moist. | Clayey SILT | 1 2 |
| 1 | | | | | | | | |
| 2 | 2 | 24/24 | 2-4 | 2-3 4-4 | | Very soft, light brown, Clayey SILT, little Organic Matter, Moist. Changing at 2.5 feet to: Brown, fine to medium SAND and Silt, wet. | 2.5' SAND | 3 |
| 3 | | | | | | | | |
| 4 | 3 | 24/12 | 4-6 | 1-3 3-1 | | Loose, light brown, fine to medium SAND and Silt wet. | | |
| 5 | | | | | | | | |
| 6 | 4 | 24/12 | 6-8 | 1-1 3-3 | | Loose, brown, fine to medium SAND and Silt, wet. | | |
| 7 | | | | | | | | |
| 8 | 5 | 24/10 | 8-10 | 1-3 4-4 | | Loose, brown, fine to medium SAND and Silt, with tip of spoon at 9.9 feet gray, Silty CLAY, some fine to medium Sand, wet. | | |
| 9 | | | | | | | | |
| 10 | 6 | 24/10 | 10-12 | 1-4 5-5 | | Loose, brown, fine to medium SAND, trace Silt, wet. | 9.9' 10' Silty CLAY SAND | 4 |
| 11 | | | | | | | | |
| 12 | 7 | 24/16 | 12-14 | 4-5 4-4 | | Loose, brown, fine to coarse SAND, little Gravel, trace Silt, wet. | | |
| 13 | | | | | | | | |
| 14 | 8 | 24/18 | 14-16 | 1-4 5-5 | | Loose, brown, fine to medium SAND, trace Silt, wet. | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).
2. Installed temporary well from 0.0 to 10.0 feet below ground surface with a 5-foot well screen, and purged 20.0 gallons of water.
3. Groundwater was encountered at approximately 2.0 feet below ground surface.
4. Installed temporary well from 10.0 to 20.0 feet below ground surface with a 5-foot well screen, and purged 35.0 gallons of water.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-13D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-13D
**Page:** 2 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 16 | 9 | 24/16 | 16-18 | 3-5 5-10 | | Medium dense, brown, fine to medium SAND, trace Silt, wet. Changing at 16.5 feet to: Brown, Clayey SILT, some fine to medium Sand, wet. | 16.5' Clayey SILT | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/16 | 18-20 | 5-8 9-7 | | Brown, Clayey SILT, some fine to medium Sand, wet. | | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/12 | 20-22 | 5-8 6-9 | | Medium dense, brown, fine to medium SAND, little Silt, wet. | 20' SAND | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/16 | 22-24 | 1-6 3-4 | | Loose, brown, fine to medium SAND, little Silt, wet. Changing at 23.0 feet to: Brown, Silty CLAY, some fine Sand, wet. | | | |
| 23 | | | | | | | 23' Silty CLAY | | |
| 24 | 13 | 24/21 | 24-26 | 2-6 8-10 | | Stiff, gray, Silty CLAY, trace fine Sand, wet. | | | |
| 25 | | | | | | | | 5 | |
| 26 | 14 | 24/12 | 26-28 | 0-0 2-3 | | Soft, brown, Silty CLAY, little fine Sand, wet. | | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/24 | 28-30 | 3-5 6-7 | | Stiff, brown, Silty CLAY, some fine Sand, wet. Changing at 28.8 feet to: Medium dense, brown, fine to medium SAND, some Silt, wet. Changing at 29.5 feet to: Soft, Silty CLAY, trace fine Sand, wet. | | | Bentonite/Grout |
| 29 | | | | | | | 28.8' SAND 29.5' Silty CLAY | | |
| 30 | 16 | 24/24 | 30-32 | 3-5 8-9 | | Stiff, gray, brown and red, Silty CLAY, trace fine to coarse Sand, wet. | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/24 | 32-34 | 2-4 | | Stiff, brown, Clayey SILT, little fine to | 32' Clayey SILT | | |

**REMARKS**

5. Installed 10-inch casing to 25.0 feet below ground surface. 12.25 inch auger advanced to 25.0 feet for 10-inch casing install.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-13D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-13D
**Page:** 3 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 6-10 | | medium Sand, wet. Changing at 33.8 feet to: Gray and brown, fine SAND, some Silt, wet. | Clayey SILT | | |
| 33 | | | | | | | 33.8' 34' SAND | | |
| 34 | 18 | 24/16 | 34-36 | 2-3 7-15 | | Stiff, brown, Clayey SILT, little fine Sand, wet. Changing at 35.4 feet to: Brown, fine SAND, some Silt, wet. | Clayey SILT | | |
| 35 | | | | | | | 35.4' SAND | 6 | |
| 36 | 19 | 24/14 | 36-38 | 5-9 18-16 | | Medium dense, brown, fine SAND and Silt, wet. | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/24 | 38-40 | 1-3 5-10 | | Medium dense, brown, fine SAND and Silt, wet. Changing at 38.8 feet to: Brown and gray, Clayey SILT, trace fine Sand, wet. | 38.8' Clayey SILT | | |
| 39 | | | | | | | | | |
| 40 | 21 | 24/16 | 40-42 | 2-10 22-22 | | Dense, gray and brown, SAND and Silt, wet. | 40' SAND | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/24 | 42-44 | 6-16 20-28 | | Dense, gray and brown, SAND and Silt, wet. | | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/18 | 44-46 | 3-6 15-15 | | Medium dense, gray and brown, SAND and Silt, wet. | | | |
| 45 | | | | | | | | 7 | |
| 46 | 24 | 24/18 | 46-48 | 8-3 6-10 | | Loose, tan and brown, fine to coarse SAND, little Silt, trace Gravel, wet. | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/18 | 48-50 | 3-6 9-25 | | Medium dense, fine to coarse SAND, little Silt, wet. | | | |
| 49 | | | | | | | | | |

**REMARKS**

6. Installed temporary well from 35.0 to 45.0 feet below ground surface with a 5-foot well screen, and purged 30.0 gallons of water.
7. Installed temporary well from 45.0 to 55.0 feet below ground surface with a 5-foot well screen, and purged 30.0 gallons of water.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI 6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

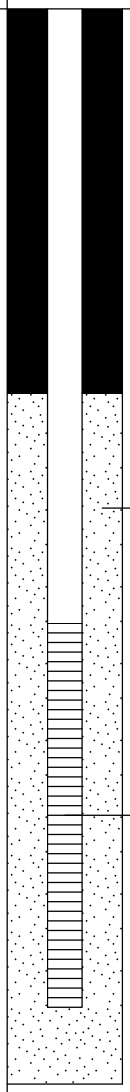
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-13D
**Page:** 4 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 26 | 24/14 | 50-52 | 5-3<br>16-19 | | Medium dense, tan and brown, fine to medium SAND, little Silt, wet. | SAND | |
| 51 | | | | | | | | |
| 52 | 27 | 24/24 | 52-54 | 3-5<br>8-11 | | Medium dense, tan and brown, fine to medium SAND, little Silt, wet. | | |
| 53 | | | | | | | | 8 |
| 54 | 28 | 24/18 | 54-56 | 2-2<br>3-4 | | Loose, tan and brown, fine to medium SAND, little Silt, trace Gravel, wet. | | |
| 55 | | | | | | | | |
| 56 | 29 | 24/24 | 56-58 | 0-2<br>3-4 | | Loose, tan and brown, fine to medium SAND, trace Silt, trace Gravel, wet. | | |
| 57 | | | | | | | | |
| 58 | 30 | 24/12 | 58-60 | 2-2<br>5-5 | | Loose, tan and brown, fine to medium SAND, trace Silt, wet. | | |
| 59 | | | | | | | | |
| 60 | 31 | 24/0 | 60-62 | 1-1<br>2-3 | | NO RECOVERY. | 60' NO RECOVERY | |
| 61 | | | | | | | | |
| 62 | 32 | 24/18 | 62-64 | 3-8<br>18-19 | | Medium dense, brown, fine to medium SAND, wet. Changing at 63.0 feet to: Brown, Clayey SILT, trace fine to coarse Sand, wet. | 62' SAND | |
| 63 | | | | | | | 63' Clayey SILT | |
| 64 | 33 | 24/12 | 64-66 | 10-16<br>24-33 | | Hard, gray, Silty CLAY, trace fine Sand, wet. | 64' Silty CLAY | |
| 65 | | | | | | | | |
| 66 | 34 | 24/15 | 66-68 | 7-16<br>30-50/3" | | Hard, gray, Silty CLAY, trace fine Sand, wet. Changing at 67.7 feet to: Gray, Silty CLAY, some fine to coarse Sand, trace Rock fragments, wet. | | |
| 67 | | | | | | | | |

**Equipment Installed**




**REMARKS**

8. Installed temporary well from 53.0 to 63.0 feet below ground surface with a 5-foot well screen, and purged 65.0 gallons of water.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-13D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-13D
**Page:** 5 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 68 | 35 | 24/12 | 68-70 | 9-52-50/3" | | Very dense, gray, fine to coarse SAND and Silt, trace Gravel, wet. Changing at 69.8 feet to: Gray, Silty CLAY, some fine to coarse Sand, wet. | Silty CLAY 68' SAND | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/18 | 70-72 | 13-26 39-45 | | Hard, Clayey SILT, some fine to coarse Sand, little Rock fragments, trace Gravel, wet. | 69.8' 70' Silty CLAY Clayey SILT | | |
| 71 | | | | | | | | | |
| 72 | 37 | 24/24 | 72-74 | 11-18 21-21 | | Hard, Clayey SILT, some fine to coarse Sand, little Rock fragments, trace Gravel, wet. | | | |
| 73 | | | | | | | | | |
| 74 | 38 | 24/24 | 74-76 | 15-22 24-37 | | Hard, CLAY & SILT, some fine to coarse Sand, little Rock fragments, wet. | 74' CLAY & SILT | | |
| 75 | | | | | | | | | |
| 76 | 39 | 24/0 | 76-78 | 15-50/6" | | NO RECOVERY. | 76' NO RECOVERY | 9 | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/24 | 78-80 | 6-26 24-20 | | Hard, gray, CLAY & SILT, little fine to coarse Sand, wet. | 78' CLAY & SILT | | |
| 79 | | | | | | | | | |
| 80 | 42 | 24/18 | 80-82 | 33-27 27-36 | | Hard, gray, Clayey SILT, little fine to coarse Sand, trace Rock fragments, wet. | 80' Clayey SILT | | |
| 81 | | | | | | | | | |
| 82 | 43 | 24/8 | 82-84 | 13-50/2" | | Hard, gray, SILT & CLAY, some Rock fragments, little fine to coarse Sand with large Boulder at 82.8 feet. | 82' SILT & CLAY | | |
| 83 | | | | | | | | | |
| 84 | 44 | 24/24 | 84-86 | 19-29 35-45 | | Crushed BOULDER. Changing at 84.5 feet to: Gray, Clayey SILT, litle fine to coarse Sand, wet. | 84' Crushed 84.5' BOULDER Clayey SILT | | |

**REMARKS**

9. Large rock shards.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-13D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-13D
**Page:** 6 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Clayey SILT | | |
| 86 | 45 | 24/0 | 86-88 | 10-50/1" | | NO RECOVERY. | 86' NO RECOVERY | 10 | |
| 87 | | | | | | | | | |
| 88 | 46 | 24/6 | 88-90 | 21-50/3" | | Hard, gray, Clayey SILT, little fine to coarse Sand with 2-inch Rock fragment at bottom. | 88' Clayey SILT | | |
| 89 | | | | | | | | | |
| 90 | 47 | 24/6 | 90-92 | 50/6" | | Hard, gray, Clayey SILT, little fine to coarse Sand, some Rock fragments, wet. | | | |
| 91 | | | | | | | | | |
| 92 | 48 | 24/18 | 92-94 | 26-48-50/6" | | Hard, gray, Clayey SILT, little fine to coarse Sand, some Rock fragments, wet. | | | |
| 93 | | | | | | | | | |
| 94 | 49 | 24/20 | 94-96 | 5-22 45-50/5" | | Hard, gray, Clayey SILT and fine to coarse Sand, little Gravel, trace Rock fragments, wet. | | | |
| 95 | | | | | | | | | |
| 96 | 50 | 24/11 | 96-98 | 20-50/5" | | Hard, gray, Clayey SILT, some fine to coarse Sand, wet. | | | |
| 97 | | | | | | | | | |
| 98 | 51 | 24/9 | 98-100 | 34-50/3" | | Hard, gray, Clayey SILT, some fine to coarse Sand, wet with 2-inch Rock fragments from 98.5 to 98.8 feet. | | | |
| 99 | | | | | | | | | |
| 100 | 52 | 24/6 | 100-102 | 15-50/0" | | Hard, gray, Clayey SILT, little fine to coarse Sand, trace Rock fragments, wet. | | | |
| 101 | | | | | | Bottom of Borehole at 101.0 Feet | 101' | 11 | |
| 102 | | | | | | | | | |

**REMARKS**

10. 1-inch rock fragments.
11. Monitoring well was installed in borehole upon completion. Well screen set from approximately 58.0 to 63.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-13M
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** J. Muntoon
**Logged by:** S. Stephenson
**Date Start/Finish:** 2-22-19 / 2-22-19
**Boring Location:**
**GS Elev.:** **Datum:** MI State Plane S Zone NAD 83

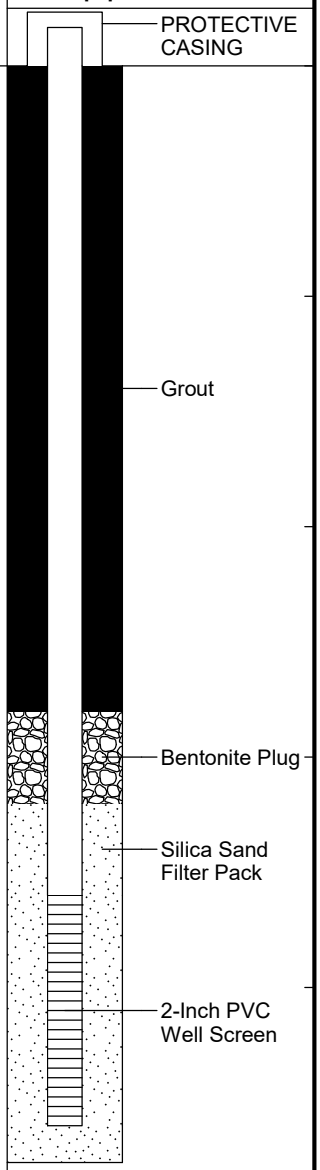
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–23 | | | | | | See boring log WV-MW-13/WV-MW-13D for soil descriptions. | | |
| 24 | | | | | | Bottom of Borehole at 23.8 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 18.0 to 23.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-13M

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-13S
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** C. Melby/ J. Markosky
**Date Start/Finish:** 3-26-19 / 3-26-19
**Boring Location:**
**GS Elev.:** **Datum:** Mi State Plane S Zone NAD 83

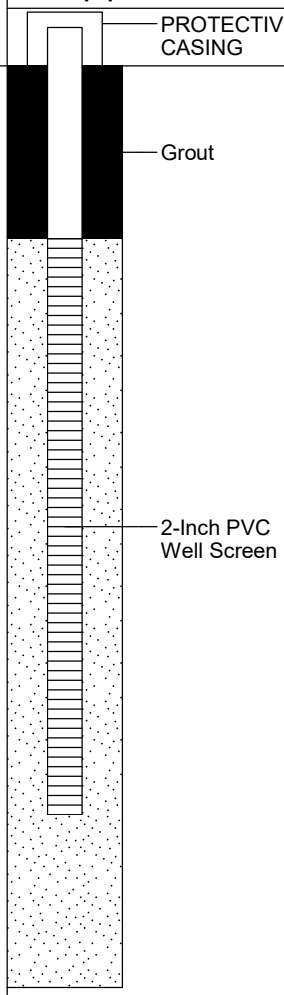
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Direct Push | MacroCore |
| **O.D. / I.D.:** | NA | 2.25" |
| **Hammer Wt.:** | NA | NA |
| **Hammer Fall:** | NA | NA |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | See boring log WV-MW-13/WV-MW-13D for soil descriptions. | | |
| 8 | | | | | | Bottom of Borehole at 8.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 1.5 to 6.5 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-13S

BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/19/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14D
**Page:** 1 **of** 9
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** J. Markosky
**Date Start/Finish:** 4-15-19 / 4-24-19
**Boring Location:** See Survey
**GS Elev.:** See Survey **Datum:** MI State Plane S Zone NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| TBD | | | | |

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/24 | 0-2 | 1-2 1-2 | 0.0 ppm | Very loose, dark brown, fine to medium SAND, some Organic Matter, dry (TOPSOIL). Changing at 1.0 foot to: Brown, fine to medium SAND, little Silt, dry (TOPSOIL). | SAND | 1 | None |
| 2 | 2 | 24/12 | 2-4 | 1-2 4-3 | 0.0 ppm | Loose, brown, fine to coarse SAND, little Silt, dry. | | | |
| 3 | | | | | | | | | |
| 4 | 3 | 24/12 | 4-6 | 2-2 2-2 | 0.0 ppm | Loose, brown, fine to coarse SAND, little Silt, dry. | | 2 | |
| 5 | | | | | | | | | |
| 6 | 4 | 24/12 | 6-8 | 0-0 1-1 | 0.0 ppm | Very loose, brown, fine to coarse SAND, little Silt, moist. | | | |
| 7 | | | | | | | | | |
| 8 | 5 | 24/24 | 8-10 | 1-1 1-1 | 0.0 ppm | Very loose, brown, fine to coarse SAND, little Silt, moist. | | | |
| 9 | | | | | | | | | |
| 10 | 6 | 24/24 | 10-12 | 1-3 2-3 | 0.0 ppm | Loose, brown, fine to coarse SAND, little Silt, moist. | | | |
| 11 | | | | | | | | | |
| 12 | 7 | 24/12 | 12-14 | 4-6 8-8 | 0.0 ppm | Loose, brown, fine to coarse SAND, little Silt, wet. | | | |
| 13 | | | | | | | | | |
| 14 | 8 | 24/24 | 14-16 | 7-9 11-14 | 0.0 ppm | Medium dense, brown, fine to coarse SAND, little Silt, wet. Changing at 14.2 feet to: Brown, CLAY & SILT, trace fine Sand, | 14.2' CLAY & SILT | | |

**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 2000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million (ppm) of isobutylene. Background was measured at 0.0 ppm.
2. Groundwater sample collected from temporary well with well screen set from approximately 4.0 to 14.0 feet below ground surface and submitted for analytical laboratory testing.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14D
**Page:** 2 **of** 9
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | dry. | CLAY & SILT | | |
| 16 | 9 | 24/24 | 16-18 | 5-8 13-14 | 0.0 ppm | Very stiff, gray, Silty CLAY, trace fine Sand, dry. | 16' Silty CLAY | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/24 | 18-20 | 8-9 14-15 | 0.0 ppm | Very stiff, gray, Silty CLAY, trace fine Sand, dry. | | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/24 | 20-22 | 10-13 13-17 | 0.0 ppm | Very stiff, gray, Silty CLAY, trace fine Sand, dry. | | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/20 | 22-24 | 0-0 4-12 | 0.0 ppm | Very stiff, gray, Silty CLAY, trace fine Sand, dry. Changing at 23.0 feet to: Brown, fine to coarse SAND, little Silt, moist. | | | |
| 23 | | | | | | | 23' SAND | | |
| 24 | 13 | 24/24 | 24-26 | 7-7 12-14 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry. | 24' CLAY | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/24 | 26-28 | 5-9 13-17 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry. | | 3 | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/24 | 28-30 | 2-8 12-13 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry. | | | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/24 | 30-32 | 5-7 12-17 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry. | | | |
| 31 | | | | | | | | | |
| 32 | 17 | 24/24 | 32-34 | 5-8 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry with 1.0 | | | |

**REMARKS**

3. Sand bailer used at 26.0 feet below ground surface. Not enough water for installation of a temporary well.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14D
**Page:** 3 **of** 9
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 10-12 | | inch Sand seam at 33.2 feet. | CLAY | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/24 | 34-36 | 5-9 12-13 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry. | | | |
| 35 | | | | | | | | | |
| 36 | 19 | 24/24 | 36-38 | 4-8 13-15 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry. | | | |
| 37 | | | | | | | | | |
| 38 | 20 | 24/24 | 38-40 | 5-10 13-17 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry. | | | |
| 39 | | | | | | | | | |
| 40 | 21 | 24/18 | 40-42 | 2-8 13-14 | 0.0 ppm | Very stiff, gray, CLAY, little Silt, dry. | | | |
| 41 | | | | | | | | | |
| 42 | 22 | 24/24 | 42-44 | 4-10 13-18 | 0.0 ppm | Very stiff, gray, Silty CLAY, dry. | 42' Silty CLAY | | |
| 43 | | | | | | | | | |
| 44 | 23 | 24/24 | 44-46 | 5-9 7-9 | 0.0 ppm | Very stiff, gray, Silty CLAY, dry with 1.0 inch Sand seam at 45.8 feet. | | | |
| 45 | | | | | | | | | |
| 46 | 24 | 24/24 | 46-48 | 7-11 11-19 | 0.0 ppm | Very stiff, gray, Silty CLAY, dry. | | | |
| 47 | | | | | | | | | |
| 48 | 25 | 24/24 | 48-50 | 2-11 31-23 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 49 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-14D

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 26 | 24/24 | 50-52 | 4-7 8-10 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine Sand, dry. | Silty CLAY | | |
| 51 | | | | | | | | | |
| 52 | 27 | 24/24 | 52-54 | 6-10 9-14 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine Sand, dry. | | | |
| 53 | | | | | | | | | |
| 54 | 28 | 24/24 | 54-56 | 9-17 27-41 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | 4 | |
| 55 | | | | | | | | | |
| 56 | 29 | 24/24 | 56-58 | 5-8 11-11 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 57 | | | | | | | | | |
| 58 | 30 | 24/24 | 58-60 | 4-7 9-11 | 0.0 ppm | Very stiff, gray, Silty CLAY, trace fine to coarse Sand, dry. | | | |
| 59 | | | | | | | | | |
| 60 | 31 | 24/12 | 60-62 | 12-12 14-15 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine to medium Sand, dry. | | | |
| 61 | | | | | | | | | |
| 62 | 32 | 24/24 | 62-64 | 2-4 7-7 | 0.0 ppm | Stiff, gray, Silty CLAY, little fine to medium Sand, dry. | | | |
| 63 | | | | | | | | | |
| 64 | 33 | 24/20 | 64-66 | 5-6 10-12 | 0.0 ppm | Very stiff, gray, Silty CLAY little fine Sand, dry. | | | |
| 65 | | | | | | | | | |
| 66 | 34 | 24/24 | 66-68 | 10-13 18-23 | 0.0 ppm | Hard, gray, Silty CLAY little fine Sand, dry. | | | |
| 67 | | | | | | | | | |

**REMARKS**

4. 3.0" split spoon used from 54.0 to 56.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14D
**Page:** 5 **of** 9
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Silty CLAY | | |
| 68 | 35 | 24/24 | 68-70 | 5-11 16-18 | 0.0 ppm | Very stiff, gray, Silty CLAY little fine Sand, dry. | | | |
| 69 | | | | | | | | | |
| 70 | 36 | 24/24 | 70-72 | 8-16 23-26 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 71 | | | | | | | | | |
| | | | | | | | 72' CLAY & SILT | | |
| 72 | 37 | 24/24 | 72-74 | 9-15 17-22 | 0.0 ppm | Hard, gray, CLAY & SILT, little fine to medium Sand, dry. | | | |
| 73 | | | | | | | | | |
| | | | | | | | 74' SILT & CLAY | | |
| 74 | 38 | 24/24 | 74-76 | 4-8 18-23 | 0.0 ppm | Very stiff, gray, SILT & CLAY, little fine to medium Sand, dry. | | | |
| 75 | | | | | | | | | |
| | | | | | | | 76' CLAY & SILT | | |
| 76 | 39 | 24/24 | 76-78 | 8-21 26-29 | 0.0 ppm | Hard, gray, CLAY & SILT, little fine to medium Sand, dry. | | | |
| 77 | | | | | | | | | |
| 78 | 40 | 24/24 | 78-80 | 8-13 23-32 | 0.0 ppm | Hard, gray, CLAY & SILT, little fine to medium Sand, dry. Changing at 79.0 feet to: Hard, dark gray, Silty CLAY, little fine Sand, dry. | | | |
| 79 | | | | | | | 79' Silty CLAY | 5 | |
| 80 | 41 | 24/24 | 80-82 | 7-12 20-28 | 0.0 ppm | Hard, dark gray, Silty CLAY, little fine Sand, dry. Changing at 81.0 feet to: Hard, gray and green, Silty CLAY, little fine Sand, dry. | | | |
| 81 | | | | | | | | | |
| 82 | 42 | 24/24 | 82-84 | 10-16 25-28 | 0.0 ppm | Hard, brown, Silty CLAY, some fine to medium Sand, dry. Changing at 82.7 feet to: Brown to olive, Silty CLAY, little fine Sand, dry. | | | |
| 83 | | | | | | | | | |
| 84 | 43 | 24/24 | 84-86 | 4-13 18-23 | 0.0 ppm | Hard, light gray to gray, Silty CLAY, little fine to medium Sand, dry. | | | |

**REMARKS**

5. Small hydraulic leak on CME 1050. Switched to CME 95.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14D
**Page:** 6 **of** 9
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Silty CLAY | | |
| 86 | 44 | 24/24 | 86-88 | 5-4 12-14 | 0.0 ppm | Very stiff, gray to olive, CLAY & SILT, little fine Sand, dry. | 86' CLAY & SILT | | |
| 87 | | | | | | | | | |
| 88 | 45 | 24/12 | 88-90 | 9-50/6" | 0.0 ppm | Very stiff, gray to olive, CLAY & SILT, little fine Sand, dry. Changing at 89.9 feet to: Gray, fine to medium SAND, dry. | | | |
| 89 | | | | | | | | | |
| 90 | 46 | 24/24 | 90-92 | 12-13 21-36 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to medium Sand, dry. | 89.9' 90' SAND Silty CLAY | | |
| 91 | | | | | | | | | |
| 92 | 47 | 24/24 | 92-94 | 5-14 20-21 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to medium Sand, dry. | | | |
| 93 | | | | | | | | | |
| 94 | 48 | 24/24 | 94-96 | 6-12 15-22 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine to medium Sand, dry. | | | |
| 95 | | | | | | | | | |
| 96 | 49 | 24/20 | 96-98 | 5-11 15-20 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine to medium Sand, dry. | | | |
| 97 | | | | | | | | | |
| 98 | 50 | 24/24 | 98-100 | 5-10 19-20 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine to medium Sand, dry. | | | |
| 99 | | | | | | | | | |
| 100 | 51 | 24/24 | 100-102 | 3-7 12-18 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine to medium Sand, dry. | | | |
| 101 | | | | | | | | | |
| 102 | 52 | 24/24 | 102-104 | 6-12 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine to | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-14D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14D
**Page:** 7 **of** 9
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 18-16 | | medium Sand, dry. | Silty CLAY | | |
| 103 | | | | | | | | | |
| 104 | 53 | 24/24 | 104-106 | 5-11 19-18 | 0.0 ppm | Very stiff, gray, Silty CLAY, little fine to medium Sand, dry. | | | |
| 105 | | | | | | | | | |
| 106 | 54 | 24/24 | 106-108 | 6-13 20-19 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 107 | | | | | | | | | |
| 108 | 55 | 24/24 | 108-110 | 7-12 19-20 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | 6 | |
| 109 | | | | | | | | | |
| 110 | 56 | 24/11 | 110-112 | 42-50/5" | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. Changing at 110.8 feet to: Gray, Silty CLAY, some fine Sand, dry. | | | |
| 111 | | | | | | | | | |
| 112 | 57 | 24/12 | 112-114 | 12-50/6" | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 113 | | | | | | | | | |
| 114 | 58 | 24/17 | 114-116 | 12-24-50/5 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 115 | | | | | | | | | |
| 116 | 59 | 24/24 | 116-118 | 10-15 31-31 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 117 | | | | | | | | | |
| 118 | 60 | 24/24 | 118-120 | 11-9 14-25 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. Changing at 119.9 feet to: Gray, fine to medium SAND, moist to dry. | | | |
| 119 | | | | | | | 119.9' | | |

**REMARKS**

6. 3.0" split spoon used from 108.0 to 110.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14D
**Page:** 8 **of** 9
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 61 | 24/24 | 120-122 | 11-16 24-30 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | 120' SAND / Silty CLAY | | |
| 121 | | | | | | | | | |
| 122 | 62 | 24/16 | 122-124 | 25-28-50/4" | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 123 | | | | | | | | | |
| 124 | 63 | 24/23 | 124-126 | 10-26 49-50/5" | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 125 | | | | | | | | | |
| 126 | 64 | 24/17 | 126-128 | 22-52-50/5" | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 127 | | | | | | | | | |
| 128 | 65 | 24/12 | 128-130 | 6-29-50/5" | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 129 | | | | | | | | | |
| 130 | 66 | 24/24 | 130-132 | 5-12 24-31 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 131 | | | | | | | | | |
| 132 | 67 | 24/23 | 132-134 | 15-24 40-50/5' | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 133 | | | | | | | | | |
| 134 | 68 | 24/12 | 134-136 | 20-38 | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. | | | |
| 135 | | | | | | | | | |
| 136 | 69 | 24/12 | 136-138 | 22-50/5" | 0.0 ppm | Hard, gray, Silty CLAY, little fine to coarse Sand, dry. Changing at 136.5 feet to: Brown to gray, fine SAND, little Silt, moist. | 136.5' SAND | | |
| 137 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-14D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14D
**Page:** 9 **of** 9
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SAND | | |
| 138 | 70 | 24/11 | 138-140 | 20-50/5" | 0.0 ppm | Very dense, gray, fine to coarse SAND, little Silt, wet. | | 7 | |
| 139 | | | | | | | | | |
| 140 | 71 | 24/18 | 140-142 | 45-44-50/6" | 0.0 ppm | Very dense, gray, fine to coarse SAND, little Silt, wet. | | | |
| 141 | | | | | | | | | |
| 142 | 72 | 24/18 | 142-144 | 11-23 40-50/4" | 0.0 ppm | Very dense, gray, fine to coarse SAND, little Silt, wet. | | | |
| 143 | | | | | | | | | |
| 144 | 73 | 24/16 | 144-146 | 12-35-50/4" | 0.0 ppm | Very dense, gray, fine to coarse SAND, little Silt, wet. Changing at 144.5 feet to: Very dense, gray, medium to coarse SAND, little Silt, wet. | | | |
| 145 | | | | | | | | | |
| 146 | 74 | 24/24 | 146-148 | | 0.0 ppm | Brown, fine to coarse SAND, some Gravel, little Silt, wet. | | | |
| 147 | | | | | | | | | |
| 148 | 75 | 24/1 | 148-150 | 50/1" | 0.0 ppm | Very dense, gray, fine to coarse SAND, little Silt, wet. | | | |
| 149 | | | | | | | | | |
| 150 | | | | | | Bottom of Borehole at 150.0 Feet | 150' | 8 | |
| 151 | | | | | | | | | |
| 152 | | | | | | | | | |
| 153 | | | | | | | | | |
| 154 | | | | | | | | | |

**REMARKS**

7. Groundwater was encountered at approximately 138.0 feet below ground surface.
8. See WV-MW-14M for well installation details.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-14D

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14M
**Page:** 1 **of** 3
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** J. Markosky
**Date Start/Finish:** 4-29-19 / 5-1-19
**Boring Location:** See Survey
**GS Elev.:** See Survey **Datum:** MI State Plane S Zone NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 1–54 | | | | | | See MW-WV-14D boring log for soil descriptions. | | | PROTECTIVE CASING |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-14M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14M
**Page:** 2 **of** 3
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | Bentonite Grout |
| 69 | | | | | | | | | |
| 70 | | | | | | | | | |
| 71 | | | | | | | | | |
| 72 | | | | | | | | | |
| 73 | | | | | | | | | |
| 74 | | | | | | | | | |
| 75 | | | | | | | | | |
| 76 | | | | | | | | | |
| 77 | | | | | | | | | |
| 78 | | | | | | | | | |
| 79 | | | | | | | | | |
| 80 | | | | | | | | | |
| 81 | | | | | | | | | |
| 82 | | | | | | | | | |
| 83 | | | | | | | | | |
| 84 | | | | | | | | | |
| 85 | | | | | | | | | |
| 86 | | | | | | | | | |
| 87 | | | | | | | | | |
| 88 | | | | | | | | | |
| 89 | | | | | | | | | |
| 90 | | | | | | | | | |
| 91 | | | | | | | | | |
| 92 | | | | | | | | | |
| 93 | | | | | | | | | |
| 94 | | | | | | | | | |
| 95 | | | | | | | | | |
| 96 | | | | | | | | | |
| 97 | | | | | | | | | |
| 98 | | | | | | | | | |
| 99 | | | | | | | | | |
| 100 | | | | | | | | | |
| 101 | | | | | | | | | |
| 102 | | | | | | | | | |
| 103 | | | | | | | | | |
| 104 | | | | | | | | | |
| 105 | | | | | | | | | |
| 106 | | | | | | | | | |
| 107 | | | | | | | | | |
| 108 | | | | | | | | | |
| 109 | | | | | | | | | |
| 110 | | | | | | | | | |
| 111 | | | | | | | | | |
| 112 | | | | | | | | | |
| 113 | | | | | | | | | |
| 114 | | | | | | | | | |
| 115 | | | | | | | | | |
| 116 | | | | | | | | | |
| 117 | | | | | | | | | |
| 118 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-14M

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14M
**Page:** 3 **of** 3
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 120–144 | | | | | | | | | Filter Sand; Top of Well Screen; 2-Inch PVC Well Screen |
| 145 | | | | | | Bottom of Borehole at 145.0 Feet | | 1 | Bottom of Well Screen |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 140.0 to 145.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-14M

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-14S
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** J. Markosky
**Date Start/Finish:** 4-28-19 / 4-29-19
**Boring Location:** See Survey
**GS Elev.:** See Survey **Datum:** Mi State Plane S Zone NAD 83

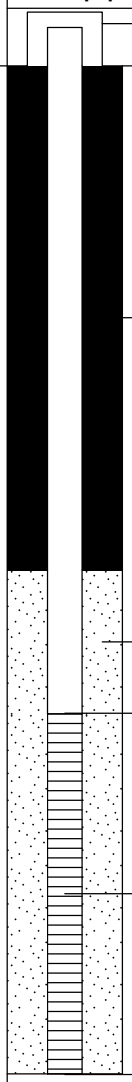
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | See MW-WV-14D boring log for soil descriptions. | | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | Bottom of Borehole at 14.0 Feet | | 1 |
| 15 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 9.0 to 14.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-14S

BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15A
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 8-28-19 / 8-30-19
**Boring Location:** North Side of Property
**GS Elev.:** NM **Datum:** MI State Plane S Zone NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

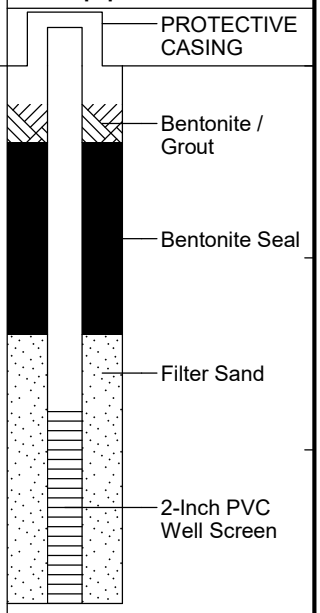
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NM | NM | NM | NM | NM |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–14 | | | | | | See MW-WV-15D boring log for soil descriptions. | | |
| 14 | | | | | | Bottom of Borehole at 14.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 9.0 to 14.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15B
**Page:** 1 **of** 1
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 8-28-19 / 8-30-19
**Boring Location:** North Side of Property
**GS Elev.:** NM **Datum:** MI State Plane S Zone NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

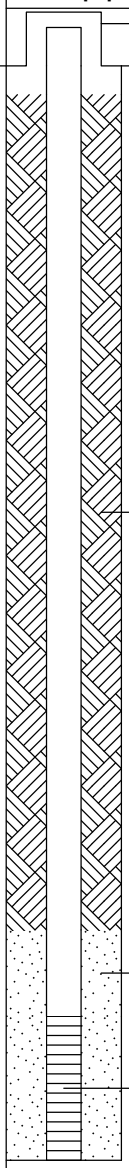
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NM | NM | NM | NM | NM |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1–37 | | | | | | See MW-WV-15D boring log for soil descriptions. | | |
| 38–39 | | | | | | Bottom of Borehole at 38.0 Feet | | 1 |

**Equipment Installed**




**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 33.0 to 38.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15C
**Page:** 1 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 8-21-19 / 8-21-19
**Boring Location:** North Side of Property
**GS Elev.:** NM **Datum:** MI State Plane S Zone NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

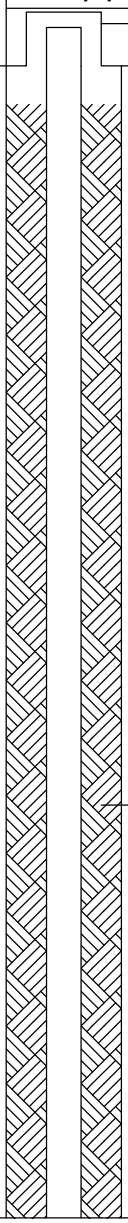
**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NM | NM | NM | NM | NM |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | See MW-WV-15D boring log for soil descriptions. | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15C
**Page:** 2 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information: No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | Filter Sand |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | 2-Inch PVC Well Screen |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |
| 50 | | | | | | Bottom of Borehole at 50.0 Feet | | 1 | |
| 51 | | | | | | | | | |
| 52 | | | | | | | | | |
| 53 | | | | | | | | | |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | | | | | | |
| 64 | | | | | | | | | |

**REMARKS**

1. Monitoring well was installed in borehole upon completion. Well screen set from 37.8 to 42.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15D
**Page:** 1 **of** 8
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** John Morehouse
**Date Start/Finish:** 8-9-19 / 8-19-19
**Boring Location:** North Side of Property
**GS Elev.:** NM **Datum:** MI State Plane S Zone NAD 83

| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **TOC Elev.:** | NA | NA |

**GROUNDWATER READINGS**

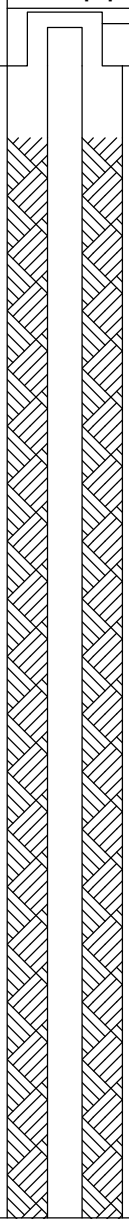
| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NM | NM | NM | NM | NM |
| | | | | |
| | | | | |

**Surveyed By:** NA **Survey Date:**

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. |
|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/14 | 0-2 | 3-6 6-9 | | Very dark grayish-brown, SILT, some fine Sand, trace Gravel, moist. Changing at 0.6 feet to: Yellowish-brown, SILT, some Sand, trace Gravel, moist. Changing at 1.2 feet to: NO RECOVERY. | SILT 1.2' NO RECOVERY 2' |
| 2 | 2 | 24/14 | 2-4 | 7-6 3-5 | | Yellowish-brown, SILT, some Sand, trace Gravel, moist. Changing at 2.4 feet to: Brownish-yellow, fine to medium SAND, trace Silt, moist. Changing at 2.8 feet to: Dark yellowish-brown, fine to medium SAND, trace Silt, moist. Changing at 3.2 feet to: NO RECOVERY. | SILT 2.4' SAND 3.2' NO RECOVERY 4' |
| 4 | 3 | 24/11 | 4-6 | 4-9 8-13 | | Brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 4.9 feet to: NO RECOVERY. | SAND 4.9' NO RECOVERY 6' |
| 6 | 4 | 24/11 | 6-8 | 3-6 7-6 | | Brown, fine to coarse SAND, trace Gravel, trace Silt, grading to medium to coarse SAND, trace Gravel, trace Silt, wet. Changing at 6.9 feet to: NO RECOVERY. | SAND 6.9' NO RECOVERY 8' |
| 8 | 5 | 24/4 | 8-10 | 2-10 9-4 | | Brown, medium to coarse SAND, trace Gravel, trace Silt, wet. Changing at 8.3 feet to: NO RECOVERY. | SAND 8.3' NO RECOVERY 10' |
| 10 | 6 | 24/12 | 10-12 | 2-4 3-4 | | Brown, medium to coarse SAND, trace Gravel, trace Silt, wet. Changing at 11.0 feet to: NO RECOVERY. | SAND 11' NO RECOVERY 12' |
| 12 | 7 | 24/17 | 12-14 | 3-9 8-10 | | Brown, medium to coarse SAND, trace Gravel, trace Silt, wet. Changing at 12.7 feet to: Dark grayish-brown, SILT & CLAY, moderately plastic, cohesive, moist. Changing at 12.8 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 13.4 feet to: NO RECOVERY. | SAND 12.7' SILT & CLAY 12.8' Silty CLAY 13.4' NO RECOVERY 14' |
| 14 | 8 | 24/13 | 14-16 | 9-12 11-10 | | Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 15.1 feet to: NO RECOVERY. | Silty CLAY 15.1' NO RECOVERY 16' |

**Remarks**

**Equipment Installed**




**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15D
**Page:** 2 **of** 8
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 9 | 24/17 | 16-18 | 3-6<br>6-6 | | Dark grayish-brown, Silty CLAY, plastic, cohesive, moist, occasional very thin lenses of fine grained Sand, moist. Changing at 17.4 feet to: NO RECOVERY. | Silty CLAY<br>17.4'<br>NO RECOVERY<br>18' | | |
| 17 | | | | | | | | | |
| 18 | 10 | 24/18 | 18-20 | 2-5<br>6-9 | | Dark grayish-brown, Silty CLAY, plastic, cohesive, occasional very thin lenses of fine Sand, moist. Changing at 18.6 feet to: Brown, fine SAND, trace Silt, wet. Changing at 18.9 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 19.5 feet to: NO RECOVERY. | Silty CLAY<br>18.6'<br>SAND<br>18.9'<br>Silty CLAY<br>19.5'<br>NO RECOVERY<br>20' | | |
| 19 | | | | | | | | | |
| 20 | 11 | 24/23 | 20-22 | 4-10<br>12-15 | | Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, occasional very thin lenses of fine Sand, moist. Changing at 21.9 feet to: NO RECOVERY. | Silty CLAY<br>21.9'<br>NO RECOVERY<br>22' | | |
| 21 | | | | | | | | | |
| 22 | 12 | 24/19 | 22-24 | 4-9<br>10-13 | | Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, occasional very thin lenses of fine Sand, moist. Changing at 23.6 feet to: NO RECOVERY. | Silty CLAY<br>23.6'<br>NO RECOVERY<br>24' | | |
| 23 | | | | | | | | | |
| 24 | 13 | 24/24 | 24-26 | 2-13<br>13-13 | | Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, occasional very thin lenses of fine Sand, moist. Changing at 24.5 feet to: Brown, fine SAND, trace Silt, wet. Changing at 24.9 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 25.3 feet to: Brown, fine SAND, trace Silt, wet. Changing at 25.6 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, moist. | Silty CLAY<br>24.5'<br>SAND<br>24.9'<br>Silty CLAY<br>25.3'<br>SAND<br>25.6'<br>Silty CLAY<br>26.2' | | |
| 25 | | | | | | | | | |
| 26 | 14 | 24/24 | 26-28 | 1-8<br>11-11 | | | SILT<br>27.4' | | |
| 27 | | | | | | | | | |
| 28 | 15 | 24/20 | 28-30 | WOH | | Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 26.2 feet to: Brown, SILT, little Sand, cohesive, non-plastic, moist. Changing at 27.4 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, moist. | Silty CLAY<br>28'<br>SAND / SILT / Silty CLAY | 1 | |
| 29 | | | | | | | | | |
| 30 | 16 | 24/24 | 30-32 | 1-2<br>3-3 | | Brown, fine SAND, Silt and Silty Clay, moist to wet. Changing at 29.7 feet to: NO RECOVERY. | 29.7'<br>NO RECOVERY<br>30' | | |
| 31 | | | | | | Grayish-brown to brown, fine SAND, some Silt, wet. Changing at 30.8 feet to: Grayish-brown to brown, SAND, Silt and Silty Clay, moist to wet. Changing at 30.9 feet to: Grayish-brown to brown, fine SAND, some Silt, wet. | SAND<br>30.8'<br>SAND / SILT / Silty CLAY<br>30.9'<br>SAND | | |
| 32 | 17 | 24/18 | 32-34 | 2-6<br>5-5 | | Brown to grayish-brown, fine SAND, little Silt, wet. Changing at 32.4 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 32.8 feet to: Brown to grayish-brown, fine SAND, little Silt, wet. | 32.4'<br>Silty CLAY<br>32.8'<br>SAND | | |
| 33 | | | | | | | | | |
| 34 | 18 | 24/14 | 34-36 | 1-2<br>4-4 | | Brown to grayish-brown, fine SAND, little | 34.2'<br>Silty CLAY<br>34.3' | | |

**REMARKS**

1. Groundwater was encountered at approximately 28.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15D
**Page:** 3 **of** 8
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 35 | | | | | | Silt, wet. Changing at 34.2 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 34.3 feet to: Brown to grayish-brown, fine SAND, little Silt, wet. | SAND<br>SAND | | |
| 36 | 19 | 24/22 | 36-38 | 4-10<br>13-11 | | Brown to grayish-brown, fine SAND, little Silt, wet. Changing at 36.1 feet to: Dark grayish-brown, fine SAND, litle Silt, wet. Changing at 36.3 feet to: Brown to grayish-brown, fine SAND, little Silt, wet. | 36.1'<br>36.3' Silty CLAY<br>SAND | | |
| 37 | | | | | | | 36.8'<br>37' SILT<br>SAND | | |
| 38 | 20 | 24/8 | 38-40 | 2-5<br>10-12 | | Changing at 36.8 feet to: Brown, SILT, cohesive, non-plastic, moist. Changing at 37.0 feet to: Brown to grayish-brown, fine SAND, little Silt, wet. Changing at 37.5 feet to: Brown, SILT, cohesive, non-plastic, moist. Changing at 37.6 feet to: Brown to grayish-brown, fine SAND, little Silt, wet. | 37.5'<br>37.6' SILT<br>SAND | | |
| 39 | | | | | | | 38.7'<br>NO RECOVERY | | |
| 40 | 21 | 24/22 | 40-42 | 1-2<br>6-9 | | Brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 38.7 feet to: NO RECOVERY. | 40'<br>SAND | | |
| 41 | | | | | | Brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 41.8 feet to: NO RECOVERY. | 41.8' | | |
| 42 | 22 | 24/19 | 42-44 | 1-5<br>7-9 | | Brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 40.5 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 40.6 feet to: Brown, GRAVEL, little Sand, trace Silt, wet. | 42' NO RECOVERY<br>42.5' SAND<br>42.6' Silty CLAY | | |
| 43 | | | | | | Changing at 40.9 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 41.0 feet to: Brown, fine to coarse SAND, trace Gravel, trace Silt, wet. Changing at 41.6 feet to: NO RECOVERY. | 42.9'<br>43' GRAVEL<br>Silty CLAY | | |
| 44 | 23 | 24/22 | 44-46 | 4-6<br>9-12 | | Brown, fine to medium SAND, trace Silt, wet. Changing at 44.6 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 44.7 feet to: Brown, fine to coarse SAND, little Gravel, trace Silt, wet. Changing at 45.4 feet to: Brown, SILT, trace fine Sand, wet. | 43.6'<br>SAND<br>44' NO RECOVERY<br>44.6' SAND | | |
| 45 | | | | | | | 44.7' Silty CLAY<br>SAND<br>45.4' | | |
| 46 | 24 | 24/24 | 46-48 | 6-14<br>24-31 | | Changing at 45.5 feet to: Brown, SILt, moderately cohesive, moist to wet. Changing at 45.8 feet to: NO RECOVERY. Brown, GRAVEL, little Sand, trace Silt, wet. Changing at 47.3 feet to: Dark grayish-brown, Sandy CLAY, moderately cohesive, slightly plastic, moist. Changing at 47.5 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 47.6 feet to: Dark brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. | SILT<br>45.8'<br>46' NO RECOVERY<br>GRAVEL | | |
| 47 | | | | | | | 47.3' | | |
| 48 | 25 | 24/24 | 48-50 | 14-30<br>30-30 | | | 47.5' Sandy CLAY<br>Silty CLAY | | |
| 49 | | | | | | | | | |
| 50 | | 60 | | | | | 50'<br>NO SAMPLE COLLECTED | | |
| 51 | | | | | | Dark brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. | | | |
| 52 | | | | | | NO SAMPLE COLLECTED. | | | |
| 53 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15D
**Page:** 4 **of** 8
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 54 | | | | | | | NO SAMPLE COLLECTED | | |
| 55 | 26 | 12/12 | 55-56 | 7-9 | | Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, moist. | 55' Silty CLAY | | |
| 56 | 27 | 24/24 | 56-58 | 7-18 20-29 | | Dark grayish-brown, Silty CLAY, plastic, cohesive, bedded, moist. Changing at 57.6 feet to: Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, some bedding, moist. | | | |
| 57 | | | | | | | | | |
| 58 | 28 | 24/24 | 58-60 | 40-39 22-22 | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, some bedding, moist. | | | |
| 59 | | | | | | | | | |
| 60 | 29 | 24/24 | 60-62 | 19-21 30-44 | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. | | | |
| 61 | | | | | | | | | |
| 62 | 30 | 24/24 | 62-64 | 3-11 17-23 | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. | | | |
| 63 | | | | | | | | | |
| 64 | 31 | 24/24 | 64-66 | 12-29 32-50 | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. | | | |
| 65 | | | | | | | | | Bentonite / Grout |
| 66 | 32 | 24/24 | 66-68 | 12-20 26-40 | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. | | | |
| 67 | | | | | | | | | |
| 68 | 33 | 24/5 | 68-70 | 17-50 | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. | 68.4' NO RECOVERY | | |
| 69 | | | | | | | | | |
| 70 | 34 | 24/24 | 70-72 | 9-19 31-42 | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. | 70' Silty CLAY | | |
| 71 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** WV-MW-15D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15D
**Page:** 5 **of** 8
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 35 | 10/8 | 72-72.8 | 30-50/4" | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 72.7 feet to: NO RECOVERY. | Silty CLAY 72.7' NO RECOVERY 74' | | |
| 73 | | | | | | | | | |
| 74 | 36 | 17/12 | 74-75.4 | 15-39-50/5" | | Dark grayish-brown, Silty CLAY, trace Gravel, plastic, cohesive, moist. Changing at 74.3 feet to: Dark grayish-brown to brown, fine to medium SAND, little to some Silt, slightly cohesive, non-plastic, moist to wet. Changing at 74.6 feet to: Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 75.0 feet to: NO RECOVERY. | 74.3' Silty CLAY SAND 75' NO RECOVERY 76' | | |
| 75 | | | | | | | | | |
| 76 | 37 | 8/5 | 76-76.7 | 30-50/2" | | | 76.4' SAND NO RECOVERY | | |
| 77 | | | | | | | | | |
| 78 | 38 | 10/10 | 78-78.8 | 20-50/4" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 76.4 feet to: NO RECOVERY. Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 78.8 feet to: NO RECOVERY. | 78' SAND 78.8' NO RECOVERY 80' | | |
| 79 | | | | | | | | | |
| 80 | 39 | 10/8 | 80-80.8 | 34-50/4" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 80.7 feet to: NO RECOVERY. | SAND 80.7' NO RECOVERY 82' | | |
| 81 | | | | | | | | | |
| 82 | 40 | 10/8 | 82-82.8 | 15-50/4" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 82.7 feet to: NO RECOVERY. | SAND 82.7' NO RECOVERY 84' | | |
| 83 | | | | | | | | | |
| 84 | 41 | 11/12 | 84-84.9 | 32-50/5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 85.0 feet to: NO RECOVERY. | SAND 85' NO RECOVERY 86' | | |
| 85 | | | | | | | | | |
| 86 | 42 | 11/11 | 86-86.9 | 31-50/5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 86.9 feet to: NO RECOVERY. | SAND 86.9' NO RECOVERY 88' | | |
| 87 | | | | | | | | | |
| 88 | 43 | 12/12 | 88-89 | 33-50 | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 88.5 feet to: Dark grayish-brown to dark yellowish-brown, fine to medium SAND, little to some Silt, moist to wet. Changing at 89.0 feet to: NO RECOVERY. | SAND 89' NO RECOVERY 90' | | |
| 89 | | | | | | | | | |
| 90 | 44 | 11/12 | 90-90.9 | 38-50/4.5" | | Dark grayish-brown, fine SAND, some Silt, | SAND | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15D
**Page:** 6 **of** 8
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 91 | | | | | | little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 91.0 feet to: NO RECOVERY. | 91' SAND; NO RECOVERY | | |
| 92 | 45 | 12/12 | 92-93 | 27-50 | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 93.0 feet to: NO RECOVERY. | 92' SAND; NO RECOVERY | | |
| 93 | | | | | | | 93' | | |
| 94 | 46 | 12/12 | 94-95 | 27-50 | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 95.0 feet to: NO RECOVERY. | 94' SAND; NO RECOVERY | | |
| 95 | | | | | | | 95' | | |
| 96 | 47 | 17/18 | 96-97.4 | 29-47-50/5" | | Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. Changing at 97.5 feet to: NO RECOVERY. | 96' Silty CLAY; NO RECOVERY | | |
| 97 | | | | | | | 97.5' | | |
| 98 | 48 | 18/18 | 98-99.5 | 23-43-50 | | Brown, fine to medium SAND, little Silt, trace Gravel, moist to wet. Changing at 98.4 feet to: Dark grayish-brown, Silty CLAY, plastic, cohesive, moist. | 98' SAND; 98.4' Silty CLAY | | |
| 99 | | | | | | | 100' | | |
| 100 | 49 | 8/7 | 100-100.7 | 48-50/2" | | Dark grayish-brown, fine to medium SAND, little Silt, trace Gravel, slightly cohesive, moist to wet. Changing at 100.4 feet to: Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 100.9 feet to: NO RECOVERY. | SAND; 100.9' NO RECOVERY | | |
| 101 | | | | | | | 102' | | |
| 102 | 50 | 10/7 | 102-102.8 | 37-50/3.5" | | Grayish-brown to brown, fine to medium SAND, little Silt, trace Gravel, slightly cohesive, moist to wet. Changing at 102.6 feet to: NO RECOVERY. | SAND; 102.6' NO RECOVERY | | |
| 103 | | | | | | | 104' | | |
| 104 | 51 | 10/8 | 104-104.8 | 37-50/4" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 104.7 feet to: NO RECOVERY. | SAND; 104.7' NO RECOVERY | | |
| 105 | | | | | | | 106' | | |
| 106 | 52 | 9/8 | 106-106.8 | 41-50/3" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 106.9 feet to: NO RECOVERY. | SAND; 106.9' NO RECOVERY | | |
| 107 | | | | | | | 108' | | |
| 108 | 53 | 11/8 | 108-108.9 | 44-50/4.5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 108.9 feet to: NO RECOVERY. | SAND; 108.9' | | |
| 109 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15D
**Page:** 7 **of** 8
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 110 | 54 | 11/14 | 110-110.9 | 38-50/5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 111.3 to 112.0 feet to: NO RECOVERY. | NO RECOVERY 110' SAND 111.3' | | |
| 111 | | | | | | | | | |
| 112 | 55 | 11/12 | 112-112.9 | 31-50/5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 113.0 feet to: NO RECOVERY. | NO RECOVERY 112' SAND 113' | | |
| 113 | | | | | | | | | |
| 114 | 56 | 17/17 | 114-115.4 | 11-36-50/5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 115.4 feet to: NO RECOVERY. | NO RECOVERY 114' SAND 115.4' | | |
| 115 | | | | | | | | | |
| 116 | 57 | 12/8 | 116-117 | 48-50/5.5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 116.9 feet to: NO RECOVERY. | NO RECOVERY 116' SAND 116.9' | | |
| 117 | | | | | | | | | |
| 118 | 58 | 18/18 | 118-119.5 | 26-49-50 | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 119.5 feet to: NO RECOVERY. | NO RECOVERY 118' SAND 119.5' | | |
| 119 | | | | | | | | | |
| 120 | 59 | 21/22 | 120-121.8 | 23-37 40-50/3" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. | NO RECOVERY 120' SAND | | |
| 121 | | | | | | | | | |
| 122 | 60 | 5/0 | 122-122.4 | 50/5" | | NO RECOVERY. | 122' NO RECOVERY | | |
| 123 | | | | | | | | | |
| 124 | 61 | 11/10 | 124-124.9 | 33-50/5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 124.8 feet to: NO RECOVERY. | 124' SAND 124.8' | | |
| 125 | | | | | | | NO RECOVERY | | |
| 126 | 62 | 10/9 | 126-126.8 | 48-50/4" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 126.9 feet to: NO RECOVERY. | 126' SAND 126.9' | | |
| 127 | | | | | | | NO RECOVERY 128' | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

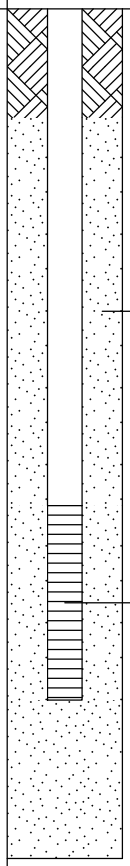
**Boring No.:** WV-MW-15D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** WV-MW-15D
**Page:** 8 **of** 8
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | Blows (/6") | Test Data | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 10/9 | 128-128.8 | 40-50/4" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 128.9 feet to: NO RECOVERY. | SAND | | |
| 129 | | | | | | | 128.9' NO RECOVERY | | |
| 130 | 64 | 11/11 | 130-130.9 | 33-50/5" | | Dark grayish-brown, fine SAND, some Silt, little Clay, trace Gravel, non to slightly plastic, cohesive, moist. Changing at 131.2 feet to: NO RECOVERY. | 130' SAND | | |
| 131 | | | | | | | 131.2' NO RECOVERY | | |
| 132 | 65 | 9/9 | 132-132.8 | 46-50/3" | | Brown, fine to medium SAND, little Silt, moist to wet. Changing at 132.6 feet to: Dusky red to dark yellowish-brown to gray, fine to medium SAND, little Silt moist to wet (weathered Sandstone). Changing at 135.4 feet to: NO RECOVERY. | 132' SAND | | Filter Sand |
| 133 | | | | | | | 133.4' NO RECOVERY | | |
| 134 | 66 | 2/2 | 134-134.2 | 50/2" | | Brown, fine to coarse SAND, little Gravel, trace Silt, wet (weathered Sandstone). Changing at 134.2 feet to: NO RECOVERY. | 134' 134.2' SAND NO RECOVERY | | |
| 135 | | | | | | | | | |
| 136 | 67 | 3/4 | 136-136.3 | 50/3" | | Dark gray, weathered SHALE, moist. | 136' SHALE | | 2-Inch PVC Well Screen |
| 137 | | | | | | | | | |
| 138 | | | | | | Bottom of Borehole at 138.0 Feet | 138' | 2 | |
| 139 | | | | | | | | | |
| 140 | | | | | | | | | |
| 141 | | | | | | | | | |
| 142 | | | | | | | | | |
| 143 | | | | | | | | | |
| 144 | | | | | | | | | |
| 145 | | | | | | | | | |
| 146 | | | | | | | | | |



**REMARKS**

2. Monitoring well was installed in borehole upon completion. Well screen set from 134.9 to 137.6 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WELL_6267781 WWW WOLVEN AVENUE.GPJ GZA_CORP.GDT 9/27/19

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-16D
**Page:** 1 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** Jerry Huntoon
**Logged by:** S. Stephenson
**Date Start/Finish:** 3-21-19 / 3-22-19
**Boring Location:** See Survey
**GS Elev.:** See Survey **Datum:** MI State Plane S Zone NAD 83

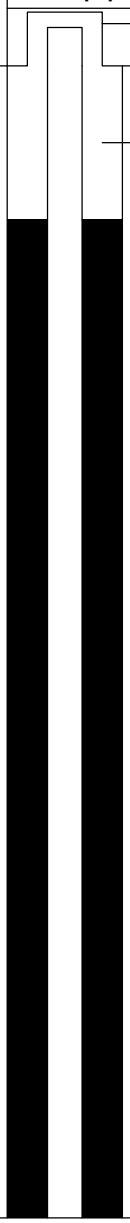
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| NM | | | | |

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | 1 | 300 | 0-25 | | ND | Blind drill. See MW-WV-16S for soil descriptions from 0.0 to 25.0 feet. | BLIND DRILL | 1 |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |

**Equipment Installed**




**REMARKS**

1. Field screening of samples for organic vapors was performed with a MiniRae 3000 photoionization detector equipped with a 10.6 eV lamp. Readings above background levels are shown in parts per million by volume (ppmv) of isobutylene. ND indicates nothing detected (<0.1 ppmv).

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-16D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-16D
**Page:** 2 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | BLIND DRILL | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |
| 25 | | | | | | | | | |
| 26 | 2 | 24/24 | 26-28 | 3-9 14-23 | ND | Very stiff, brown, CLAY & SILT, little Sand, trace Rock fragments. | 26' CLAY & SILT | 2 | |
| 27 | | | | | | | | | |
| 28 | 3 | 24/24 | 28-30 | 6-7 8-16 | ND | Very stiff, brown, CLAY & SILT, little Sand, trace Rock fragments. Silt lenses from approximately 28.4 to 28.7 feet below ground surface. | | | |
| 29 | | | | | | | | | |
| 30 | 4 | 24/24 | 30-32 | 5-8 14-19 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 31 | | | | | | | | | |
| 32 | 5 | 24/24 | 32-34 | 5-9 | ND | Very stiff, brown, CLAY & SILT, trace Sand, | | | |

**REMARKS**

2. Second borehole drilling at MW-WV-16D.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-16D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-16D
**Page:** 3 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 29-33 | | wet. | CLAY & SILT | | |
| 33 | | | | | | | | | |
| 34 | 6 | 24/24 | 34-36 | 9-8 14-17 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 35 | | | | | | | | | |
| 36 | 7 | 24/24 | 36-38 | 11-7 12-17 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 37 | | | | | | | | | |
| 38 | 8 | 24/24 | 38-40 | 5-10 19-24 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 39 | | | | | | | | | |
| 40 | 9 | 24/24 | 40-42 | 4-12 15-26 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 41 | | | | | | | | | |
| 42 | 10 | 24/24 | 42-44 | 5-9 12-14 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 43 | | | | | | | | | |
| 44 | 11 | 24/24 | 44-46 | 6-10 15-21 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 45 | | | | | | | | | Bentonite Grout |
| 46 | 12 | 24/24 | 46-48 | 4-9 19-24 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. Changing at 47.5 feet to: Brown and gray, fine SAND, some Silt, wet. | | | |
| 47 | | | | | | | 47.5' SAND 48' | | |
| 48 | 13 | 24/24 | 48-50 | 3-7 6-8 | ND | Stiff, brown, CLAY & SILT, trace Sand, wet. Changing at 48.5 feet to: Brown, fine SAND, some Silt, wet. Changing at 49.0 feet to: Brown, Clayey SILT, trace Sand, wet. | CLAY & SILT 48.5' SAND 49' | | |
| 49 | | | | | | | Clayey SILT | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-16D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-16D
**Page:** 4 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| | 14 | 24/24 | 50-52 | 3-9 9-16 | ND | Brown, Clayey SILT, some Sand, wet. Changing at 51.7 feet to: Brown, CLAY & SILT, trace Sand, wet. | Clayey SILT | | |
| 51 | | | | | | | 51.5' CLAY & SILT | | |
| 52 | 15 | 24/24 | 52-54 | 3-8 14-23 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 53 | | | | | | | | | |
| 54 | 16 | 24/24 | 54-56 | 5-10 16-19 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 55 | | | | | | | | | |
| 56 | 17 | 24/24 | 56-58 | 2-7 13-19 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 57 | | | | | | | | | |
| 58 | 18 | 24/24 | 58-60 | 3-10 15-21 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 59 | | | | | | | | | |
| 60 | 19 | 24/24 | 60-62 | 3-8 17-25 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 61 | | | | | | | | | |
| 62 | 20 | 24/24 | 62-64 | 2-11 15-22 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 63 | | | | | | | | | |
| 64 | 21 | 24/24 | 64-66 | 4-10 14-19 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 65 | | | | | | | | | |
| 66 | 22 | 24 | 66-68 | 4-11 16-21 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. | | | |
| 67 | | | | | | | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-16D

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-16D
**Page:** 5 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 68 | 23 | 24/24 | 68-70 | 4-11 19-23 | ND | Very stiff, brown, CLAY & SILT, trace Sand, wet. Changing at 69.0 feet to: Brown, Silty CLAY, trace Sand, wet. | CLAY & SILT | | |
| 69 | | | | | | | 69' Silty CLAY | | |
| 70 | 24 | 24/24 | 70-72 | 3-14 23-27 | ND | Brown, Silty CLAY, trace Sand, wet. Changing at 71.0 feet to: Brown, CLAY & SILT, wet. | | | |
| 71 | | | | | | | 71' CLAY & SILT | | |
| 72 | 25 | 24/24 | 72-74 | 4-10 17-26 | ND | Very stiff, brown, Silty CLAY, trace Sand, wet. Changing at 73.0 feet to: Dark brown and dark gray, Silty CLAY, trace Sand, wet. | 72' Silty CLAY | | |
| 73 | | | | | | | | | |
| 74 | 26 | 24/18 | 74-76 | 10-19 33-39 | ND | Hard, black and gray with slight bue and green tinge, Silty CLAY, trace Sand, wet. Changing at 75.8 feet to: Green, CLAY & SILT, some Sand, wet. | | | |
| 75 | | | | | | | 75.8' | | |
| 76 | 27 | 24/12 | 76-78 | 1-6 15-25 | ND | Very stiff, black and gray, Silty CLAY, wet. changing at 77.5 feet to: Pale green and gray, CLAY & SILT, little to trace Sand, wet. | 76' CLAY & SILT Silty CLAY | | |
| 77 | | | | | | | 77.5' CLAY & SILT | | |
| 78 | 28 | 24/18 | 78-80 | 10-20 26-38 | ND | Pale green and gray, CLAY & SILT, little to trace Sand, wet. | | | |
| 79 | | | | | | | | | |
| 80 | 29 | 24/24 | 80-82 | 11-24 35-39 | ND | Pale green and gray, CLAY & SILT, little to trace Sand, wet. | | | |
| 81 | | | | | | | | | |
| 82 | 30 | 24/24 | 82-84 | 7-16 24-38 | ND | Pale green and gray, CLAY & SILT, little to trace Sand, wet. | | | |
| 83 | | | | | | | | | |
| 84 | 31 | 24/12 | 84-86 | 12-50/6" | ND | Pale green and gray, CLAY & SILT, little to trace Sand, wet. Pulverized rock at 85.9 feet below ground surface. | | | |

**REMARKS**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-16D

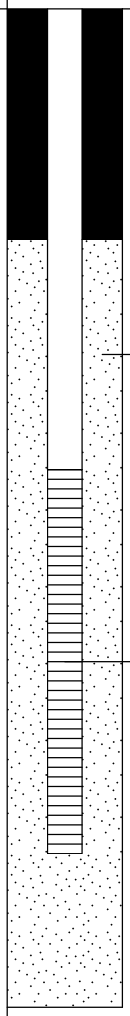
GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-16D
**Page:** 6 **of** 6
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | CLAY & SILT | |
| 86 | 32 | 24/18 | 86-88 | 2-5<br>6-9 | ND | Gray, CLAY & SILT, little Sand, wet. Changing at 86.2 feet to: Brown and gray, fine SAND and SILT, wet. | 86.2'<br>SAND and SILT | 3 |
| 87 | | | | | | | | |
| 88 | 33 | 24/18 | 88-90 | 6-24-50/6" | ND | Very dense, brown and gray, fine SAND, some Silt, wet. | 88'<br>SAND | |
| 89 | | | | | | | | |
| 90 | 34 | 24/8 | 90-92 | 37-50/2" | ND | Very dense, brown and gray, fine SAND, some Silt, wet. | | |
| 91 | | | | | | | | |
| 92 | 35 | 24/10 | 92-94 | 24-50/4" | ND | Very dense, brown and gray, fine SAND, some Silt, wet. | | |
| 93 | | | | | | | | |
| 94 | 36 | 24/6 | 94-96 | 50/6" | ND | Very dense, brown and gray, fine SAND, some Silt, wet. | | |
| 95 | | | | | | | | |
| 96 | 37 | 24/18 | 96-98 | 18-31-50/6" | ND | Brown and gray, Clayey SILT, little fine to coarse Sand, dry. | 96'<br>Clayey SILT | |
| 97 | | | | | | | | |
| 98 | | | | | | Bottom of Borehole at 98.0 Feet | 98' | 4 |
| 99 | | | | | | | | |
| 100 | | | | | | | | |
| 101 | | | | | | | | |
| 102 | | | | | | | | |

**Equipment Installed**




**REMARKS**

3. Groundwater sample was collected from temporary well with a well screen from approximately 91.0 to 96.0 feet.
4. Monitoring well was installed in borehole upon completion. Well screen set from 91.0 to 96.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-16D

BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

**GZA GeoEnvironmental, Inc.**
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-16S
**Page:** 1 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

**Contractor:** Stearns Drilling Company
**Foreman:** J. Muntoon
**Logged by:** Sheryl Stephenson
**Date Start/Finish:** 3-19-19 / 3-20-19
**Boring Location:** See Survey
**GS Elev.:** See Survey **Datum:** MI State Plane S Zone NAD 83

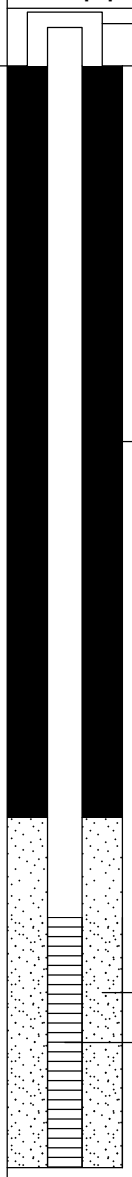
| | Auger/ Casing | Sampler |
|---|---|---|
| **Type:** | Hollow Stem Auger | Split Spoon |
| **O.D. / I.D.:** | 12.25" / 4.25" | 2.0" / 1 3/8" |
| **Hammer Wt.:** | NA | 140lbs |
| **Hammer Fall:** | NA | 30.0" |
| **Other:** | NA | NA |

**GROUNDWATER READINGS**

| Date | Time | Depth | Casing | Stab |
|---|---|---|---|---|
| | | | | |

| Depth | Sample No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 24/6 | 0-2 | 1-1 1-1 | ND | Very loose, brown, TOPSOIL. | TOPSOIL | |
| 2 | 2 | 24/18 | 2-4 | 2-3 4-4 | ND | Loose, light brown, fine SAND, little Silt, moist. | 2' SAND | |
| 4 | 3 | 24/18 | 4-6 | 3-5 5-4 | ND | Medium dense, light brown and gray, fine SAND, little Silt, trace fine Gravel, moist. | | |
| 6 | 4 | 24/18 | 6-8 | 4-7 5-5 | ND | Medium dense, light brown, fine to coarse SAND, little Gravel, little Silt, wet. Changing at 7.5 feet to: Orange and brown, fine SAND, little Silt, wet. | | 1 |
| 8 | 5 | 24/12 | 8-10 | 2-4 6-5 | ND | Medium dense, brown, fine SAND, some Silt, trace fine Gravel, wet. | | 2 |
| 10 | 6 | 24/24 | 10-12 | 1-6 6-5 | ND | Medium dense, brown, fine SAND, some Silt, wet. Changing at 11.0 feet to: Brown, fine to coarse SAND, some Silt, little fine Gravel, wet. | 12' Clayey SILT | |
| 12 | 7 | 24/18 | 12-14 | 9-11 12-17 | ND | Very stiff, gray, Clayey SILT, some fine to coarse Sand, wet. | 14' SAND | |
| 14 | 8 | 24/18 | 14-16 | 6-12 12-13 | ND | Medium dense, gray, fine to medium SAND, some Silt, trace fine Gravel, wet. Changing at 15.0 feet to: Gray, Clayey SILT, little fine to coarse Sand, dry. | 15' Clayey SILT | 3 |
| 16 | 9 | 24/18 | 16-18 | 5-11 9-13 | ND | Medium dense, gray, SAND and SILT, trace fine Gravel, moist. | 16' SAND and SILT | |
| 18 | 10 | 24/8 | 18-20 | 7-16 14-13 | ND | Dense, brown, fine to medium SAND, some Silt, wet. | 18' SAND | |
| 20 | 11 | 24/12 | 20-22 | 1-7 8-12 | ND | Medium dense, fine to medium SAND, some Silt, wet. Changing at 21.0 feet to: Brown, Clayey SILT, some Sand, trace fine Gravel, moist. | 21' Clayey SILT | |
| 22 | 12 | 24/0 | 22-24 | 9-13 15-15 | | NO RECOVERY. | 22' NO RECOVERY | 4 |

**Equipment Installed**




**REMARKS**

1. Groundwater was encountered at approximately 6.0 feet below ground surface.
2. Temporary well installed from 4.0 to 14.0 feet below ground surface. Well screen interval from 9.0 to 14.0 feet below ground surface. Purged 25.0 gallons of water.
3. Casing set at 15.0 feet below ground surface.
4. 2.0-inch of Sand and Silt with large Gabbro fragment and cohesive nature.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.



BORING_WI_6267781 WWW WOLVEN AVENUE.GPJ WI_DNR.GDT 4/17/20

GZA GeoEnvironmental, Inc.
*Engineers and Scientists*

Wolverine World Wide
Wolven Avenue Area
Algoma Twp, Kent County, Michigan

**Boring No.:** MW-WV-16S
**Page:** 2 **of** 2
**File No.:** 16.0062677.81
**Check:** Kate McDonald

| Depth | Sample Information No. | Pen./ Rec. (in.) | Depth (Ft.) | % REC | % RQD | Sample Description & Classification | Stratum Desc. | Remarks | Equipment Installed |
|---|---|---|---|---|---|---|---|---|---|
| 24 | 13 | 24/18 | 24-26 | 5-5 9-10 | ND | Medium dense, brown, Clayey SILT, some Sand, trace fine Gravel, wet. Changing at 23.0 feet to: Brown, CLAY & SILT, trace Gravel, moist. | NO RECOVERY 24' Clayey SILT 25' CLAY & SILT 26' | | |
| 26 | | | | | | Bottom of Borehole at 26.0 Feet | | 5 | |
| 27 | | | | | | | | | |
| 28 | | | | | | | | | |
| 29 | | | | | | | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | | | | |
| 32 | | | | | | | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |
| 38 | | | | | | | | | |
| 39 | | | | | | | | | |
| 40 | | | | | | | | | |
| 41 | | | | | | | | | |
| 42 | | | | | | | | | |
| 43 | | | | | | | | | |
| 44 | | | | | | | | | |
| 45 | | | | | | | | | |
| 46 | | | | | | | | | |
| 47 | | | | | | | | | |
| 48 | | | | | | | | | |
| 49 | | | | | | | | | |

**REMARKS**

5. Monitoring well was installed in borehole upon completion. Well screen set from 17.0 to 22.0 feet below ground surface.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

**Boring No.:** MW-WV-16S

# APPENDIX B – STANDARD OPERATING PROCEDURES

**PURPOSE**

The purpose of the Standard Operating Procedure (SOP) is to obtain pore water samples for analysis for PFAS that are representative of environmental conditions at the location sampled.

**PREPARATION**

If a sample cannot be obtained safely, the sample should not be collected at all and the circumstances shall be documented in the sampler's field notes. This procedure requires a minimum of two sample personnel for safety concerns.

Sampling locations shall be permanently located using a global positioning system (GPS) unit for future reference. The expected accuracy of the GPS unit shall be determined in advance and specified in the Sampling and Analysis Plan (SAP).

When collecting surface water, pore water, and sediment samples in the same location, sampling should occur in that order: surface water samples first, then pore water samples, and finally sediment samples.

**EQUIPMENT AND MATERIALS**

The following equipment is typically used in collecting pore water samples:

- Appropriate health and safety gear as indicated in an approved site-specific Health & Safety Plan.
- Site-Specific SAP which includes a map and other project-specific information including field data from last sampling event, if available.
- Waders.
- Boat.
- Sample containers, preserved as necessary, cooler, and double-bagged ice.
- Field worksheets, sample labels, and chain of custody forms.
- Pencil/pen and calculator.
- Camera to take digital pictures.
- The manufacturer’s instruction manuals for all equipment.
- Ruler or staff gauge for measuring water depth.
- GPS unit or similar device.
- Decontamination supplies/equipment; including laboratory-grade PFAS-free water.
- Paper towels.
- Henry sampler (Push Point).
- Flange for Henry sampler to reduce likelihood of surface water intrusion.
- Shop-fabricated sampler for use in locations that are too deep or where sediment depths prevent the use of the Henry sampler. See attachment for a drawing and picture describing the shop-fabricated sampler.
- A multiparameter meter (e.g., YSI PRO or other approved meter as specified in the site-specific QAPP) and flow through cell for measuring pH, specific conductivity in µS/cm, dissolved oxygen, oxidation-reduction potential (ORP), and temperature (°C).
- A probe guard for the multiparameter meter to take in-situ parameter surface water readings.
- A Turbidity Meter (e.g., Hach 2100P or 2100Q or other approved meter as specified in the site-specific QAPP).
- Appropriate calibration solutions for the multi-parameter and turbidity meters, if water quality parameters are collected.

- Peristaltic pump and tubing
- Toolbox to include general items such as large and small wrenches, pipe wrenches, pliers, screw drivers, 25-foot measuring tape, sharp knife (locking blade), and duct tape, at a minimum.

**PROCEDURE**

In general, all instrumentation necessary for field monitoring and health and safety purposes shall be maintained, tested, and inspected according to the manufacturer's instructions. The manufacturer's instruction manuals for field equipment shall be kept on-site with the equipment.

All instruments will be successfully calibrated once by the sampling team prior to the sampling event according to SOP A15: *Calibration of Field Instruments*.

Instruments will be calibrated at the beginning of each sampling day at the site and will be checked (in the run mode) in the morning and again at the end of the day. Instrument calibration will be performed additional times during the sampling day if instrument readings appear to be significantly different than previously observed.

Digital photographs are usually taken at each sampling location, upstream and downstream from the same position so that consistency can be maintained between sampling rounds.

If not previously done, use a GPS unit to permanently mark the sample location for future reference (See SOP A11: *Global Positioning System*).

If the stream/creek/water body must be waded to collect pore water samples, the water should not exceed three feet in depth. If the water exceeds three feet, samples will be collected by boat.

Using a stream staff/gage or similar measuring device, measure the depth of water from the bottom of the streambed/lakebed to the surface of the water, in feet, directly downstream of each sampling location and record on the *Pore Water Worksheet*. Some sites may have a permanently installed staff gage at one location to monitor water levels instead of, or in addition to, collecting measurements at each separate location.

Pore water samples to be collected from the same water body should be collected sequentially from downstream to upstream sample locations. Sample locations will be approached from the downstream side to minimize bottom sediment disturbance, and the sampler should stand down stream of the sampling device . Water samples collected from a boat shall be collected from the bow or upstream side of the boat, away from the motor, with extreme care taken to avoid contamination of the sample.

At each sample location either a Henry sampler or the shop-fabricated sampler will be driven through a flange in the stream bottom. The purpose of the flange is to reduce surface water intrusion during sampling. The flange is carefully placed on top of the sediment. The sampler is inserted through the flange to the desired depth. The flange should fit snuggly around the body of the sampler to prevent surface water from contaminating the pore water sample. Samplers will estimate the thickness of organic sediment on the bottom of the river based on resistance. The sampler inlet will be positioned 6-12 inches below the base of the loose sediment.

Samplers will use a peristaltic pump to remove fines from the sampler to facilitate flow. During purging, samplers will monitor and record indicator field parameters (turbidity, temperature, pH, specific conductance) at 3 minute or greater intervals. All measurements, except turbidity will be taken using a flow through cell. The pore water will be sampled using low-flow sampling methods as described below once the field readings from the pore water have stabilized and the pore water readings are distinguishable from the river readings. The following criteria shall be used to determine if pore water is ready for sampling (in order of preference):

1. There is a >10% difference between the river and pore water field parameter readings; OR
2. There is a >10% difference between the river and pore water readings for two out of the 3 readings; OR

3. The sample has cleared (no visible fines, turbidity at least 10% lower than river reading) and the sampler has been purged for at least 15 minutes.

When field parameters are stabilized in accordance with the criteria above, samples may be collected directly into the sample containers. Collect duplicates and other quality control samples as required in the SAP.

Once sampling containers are filled with the appropriate amount, they are capped and cleaned to remove any potential residue. Place samples in re-sealable plastic bags and store the samples in accordance with appropriate protocols. If samples require cooling, the samples shall be placed in a cooler of **double-bagged** ice.

**QUALITY ASSURANCE SAMPLES**

Collect appropriate quality assurance samples as specified in the site-specific SAP. At a minimum, at least one duplicate, one MS/MSD, and one field blank (for PFAS) should be collected per 20 samples. Duplicate samples are collected by filling a separate container for each analysis immediately following the actual field sample collection and should be in the same priority order as indicated in the SAP. Duplicate samples are typically not intended to be blind duplicate samples.

Equipment blanks should be collected on non-disposable equipment to ensure that the equipment is clean and the decontamination procedure is adequate (e.g., syringes, glass or stainless steel containers, etc.).

If using an in-line filter for dissolved metals, collect an equipment blank prior to sampling by running deionized water through the filter and collecting a sample for dissolved metals to ensure the integrity of the filter.

**DECONTAMINATION**

Decontaminate equipment according to GZA SOP A10: *Decontamination Procedure*. Disposable sampling equipment shall be discarded after completing the sampling task and not reused.

**RECORDS AND DOCUMENTATION**

In general, all data and sampling information will be documented as recorded as specified in the SAP. Specific reporting of these sampling events may include, but is not limited to, the following information:

1. Samples collected.
2. Date and time of sample collection.
3. Water depths at the sampling locations.
4. Any water quality parameter readings taken.
5. General physical description of the samples and sampling locations.
6. Digital photographs of sampling locations including one or more of the larger surrounding area, along with any notes on the photographs.

**SPECIAL NOTES**

None.

**APPLICABLE STANDARDS AND REFERENCES**

U.S. Environmental Protection Agency, region 4, Science and Ecosystem support Division, *Standard Operating Procedure SESDPROC-513-R3*, December 14, 2016.

**ATTACHMENT**

Pore Water Worksheet

## Attachment A – Pore Water Sampling Worksheet

**Date:** **Location ID:**

**Weather Conditions:** **Sampler's Name:**

**Water Depth (ft):** **Sampler Screen Interval (ft) (below water surface)**

**Sediment Thickness (ft) (est):**

**Start time** **Sample Time**

| Time | Water Level (ft) | Drawdown (ft) | Purge Rate | Temp (°C) | | Specific Conductance (us/cm) | | Dissolved Oxygen (mg/L) | | Oxidation Reduction Potential (mV) | | pH (SU) | | Turbidity (NTU) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | River Water | Pore Water | River Water | Pore Water | River Water | Pore Water | River Water | Pore Water | River Water | Pore Water | River Water | Pore Water |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

| Time | Water Level (ft) | Drawdown (ft) | Purge Rate | Temp (°C) | | Specific Conductance (us/cm) | | Dissolved Oxygen (mg/L) | | Oxidation Reduction Potential (mV) | | pH (SU) | | Turbidity (NTU) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | River Water | Pore Water | River Water | Pore Water | River Water | Pore Water | River Water | Pore Water | River Water | Pore Water | River Water | Pore Water |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

**PURPOSE**

The purpose of the Standard Operating Procedure (SOP) is to install piezometers in a manner in which they can be used for measurement of groundwater to surface water flow.

**EQUIPMENT AND MATERIALS**

- Hand auger
- Stainless steel well screen
- Galvanized threaded piping
- Dielectric Pipe Couplings
- Pipe wrenches
- Well/fence post driver
- Vented well cap
- Bentonite seal and concrete pad for piezometers installed on the riverbank.
- GPS unit or similar device
- Camera to take digital pictures
- Appropriate health and safety PPE and an approved site-specific Health and Safety Plan

**INSTALLATION PROCEDURES**

1. Using a pipe wrench, assemble the well screen and galvanized piping

2. Hand Auger as needed, then hand drive piezometer casing so that the top of screen is approximately 3 feet below the river bottom. The top of the piezometer should be above the estimated flood level based on observations of vegetation and deposition

3. Make a note of the general material (gravel vs sediment) on a GZA boring log. Calculate the depth of the screen beneath the floor of the river.

4. Piezometer completion shall include a 1-foot bentonite seal and concrete pad for those installed on the riverbank. If in-stream piezometers are installed, the bentonite seal and concrete pad shall not be installed.

5. Use a GPS to permanently mark the piezometer location

**MEASUREMENT PROCEDURES**

Water level measurements shall be collected following the procedures outlined in *SOP A14, Water Level Measurement* and recorded on the form included in SOP A14. Groundwater analytical samples may be collected from piezometers following the procedures outlined in *SOP A29, Piezometer Sampling*. If they will be used for groundwater sample collection, piezometers should be developed in accordance with *SOP A13, Well Development* and allowed to stabilize for 1 week prior to sampling.

**RECORDS AND DOCUMENTATION**

The details of the installation shall be recorded on the GZA boring log. If needed, additional information can be attached as a separate sheet.

**PURPOSE**

The purpose of the Standard Operating Procedure (SOP) is to obtain piezometer samples for analysis for PFAS that are representative of environmental conditions at the location sampled.

**PREPARATION**

If a sample cannot be obtained safely, the sample should not be collected at all and the circumstances shall be documented in the sampler's field notes. This procedure requires a minimum of two sample personnel for safety concerns.

Sampling locations shall be permanently located using a global positioning system (GPS) unit for future reference. The expected accuracy of the GPS unit shall be determined in advance and specified in the Sampling and Analysis Plan (SAP).

**EQUIPMENT AND MATERIALS**

The following equipment is typically used in collecting pore water samples:

- Appropriate health and safety gear as indicated in an approved site-specific Health & Safety Plan.
- Site-Specific SAP which includes a map and other project-specific information including field data from last sampling event, if available.
- Sample containers, preserved as necessary, cooler, and double-bagged ice.
- Field worksheets, sample labels, and chain of custody forms.
- Pencil/pen and calculator.
- Camera to take digital pictures.
- The manufacturer’s instruction manuals for all equipment.
- Ruler or staff gauge for measuring water depth.
- GPS unit or similar device.
- Decontamination supplies/equipment; including laboratory-grade PFAS-free water.
- Paper towels.
- A multiparameter meter (e.g., YSI PRO or other approved meter as specified in the site-specific QAPP) and flow through cell for measuring pH, specific conductivity in µS/cm, dissolved oxygen, oxidation-reduction potential (ORP), and temperature (°C).
- A Turbidity Meter (e.g., Hach 2100P or 2100Q or other approved meter as specified in the site-specific QAPP).
- Appropriate calibration solutions for the multi-parameter and turbidity meters, if water quality parameters are collected.
- Peristaltic pump and tubing
- Toolbox to include general items such as large and small wrenches, pipe wrenches, pliers, screw drivers, 25-foot measuring tape, sharp knife (locking blade), and duct tape, at a minimum.

**PROCEDURE**

In general, all instrumentation necessary for field monitoring and health and safety purposes shall be maintained, tested, and inspected according to the manufacturer's instructions. The manufacturer’s instruction manuals for field equipment shall be kept on-site with the equipment.

All instruments will be successfully calibrated once by the sampling team prior to the sampling event according to SOP A15: *Calibration of Field Instruments*.

Instruments will be calibrated at the beginning of each sampling day at the site and will be checked (in the run mode) in the morning and again at the end of the day. Instrument calibration will be performed additional times during the sampling day if instrument readings appear to be significantly different than previously observed.

Digital photographs are usually taken at each sampling location, upstream and downstream from the same position so that consistency can be maintained between sampling rounds.

If not previously done, use a GPS unit to permanently mark the sample location for future reference (See SOP A11: *Global Positioning System*).

**PURGING AND SAMPLING PROCEDURE**

Purging and sampling piezometers in order of increasing chemical concentrations (known or anticipated) is preferred. See the QAPP for additional information.

1. Initial Water Level

   Measure and record the depth to water (to 0.01 ft.) before any disturbance to the piezometer. Care should be taken to minimize suspension of any particulates attached to the sides. The initial water level is recorded on the worksheet.

2. Install sampling tubing.

   Lower tubing slowly into the piezometer so that the intake is located at the center of the saturated screened interval at a depth that will remain under water at all times. The lowest historical midpoint of the saturated screen length is often used as the location of the intake. If possible keep the pump or tubing intake at least two feet above the bottom of the piezometer, to minimize mobilization of particulates present in the bottom of the piezometer. The tubing shall be secured to the piezometer casing (or PVC stick-up) to minimize movement.

3. Measure Water Level

   Measure and record the water level again with the equipment in the piezometer before starting the pump.

4. Purging

   From the time the pump starts purging and until the time the samples are collected, the purged water is discharged into a graduated bucket to determine the total volume of groundwater purged. This information is recorded on the worksheet.

   Start the pump at its lowest speed setting and slowly increase the speed until discharge occurs. Check the water level. Check equipment for water leaks and if present, fix or replace the affected equipment. Try to match the final pumping rate used during previous sampling events. Otherwise, adjust pump speed until there is little or no water level drawdown. If the minimal drawdown that can be achieved exceeds 0.3 feet, but remains stable, continue purging.

   Monitor and record the water level, draw down, and pumping rate, every 5 minutes, or as appropriate, during purging. **Readings shall not be less than 5 minutes apart.** Record any pumping rate adjustments (both time and flow rate). Adjustments are best made in the first 15 minutes of pumping in order to help minimize purging time. Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to avoid drawdown and to ensure stabilization of monitoring parameters. **Pumping rates shall not be less than 50 ml/minute.**

   If a constant water level cannot be maintained (e.g., if the recovery rate to the piezometer is less than 50 ml/minute, or the piezometer is being essentially dewatered during purging), the initial water level was above the top of the screen and the water level falls below the top of the piezometer screen, or the water level continues to drop after the initial 15 minutes at a rate that is greater than the maximum allowable drawdown in the chart below, the piezometer should be considered to have insufficient recharge for low flow sampling. The pump should be stopped and the piezometer should be sampled as soon as the water level has recovered sufficiently to collect the volume needed for all anticipated samples. A water level measurement needs to be performed and recorded, and one discharge line volume of water must be purged, before samples are collected with the pump.

1. Monitor indicator field parameters.

   During piezometer purging, monitor and record indicator field parameters (turbidity, temperature, specific conductance, pH, ORP, and DO) at a frequency of 5 minute intervals or greater (e.g., every 10 minutes until the piezometer starts to stabilize, then every 5 minutes until stabilization). **Readings shall NOT be taken less than 5 minutes apart.**

   The pump's flow rate must be able to "turn over" at least one flow-through cell volume between measurements (for a 250 ml flow-through cell with a flow rate of 50 ml/minute, the monitoring frequency would be every 5 minutes; for a 500 ml flow-through cell at the same flow rate, it would be every 10 minutes). If the cell volume cannot be replaced in the proper interval, (e.g., 5 minute for a 250 ml flow through cell) then the time between measurements must be increased accordingly.

   All measurements, except turbidity, must be obtained using a flow-through cell. Samples for turbidity measurements must be obtained before the water enters the flow-through cell. Rinse the turbidity vial with DI water before collecting the first sample. Rinse the vial with DI water between readings to eliminate any sediment that may have collected on the bottom.

   See SOP A16 for additional details on field parameter readings for low-flow sampling.

   **NOTE: There is a 2-hour time limit for each piezometer unless specified differently in the site-specific SAP.**

   The piezometer is considered ready for sample collection once the water level and the indicator parameters have stabilized and the purge volume requirement has been met, or two hours of purge time has elapsed.

   <u>Stabilization is considered to be achieved when three consecutive readings at 5-minute intervals are within the following limits:</u>

   - **Water Level (ft): No change in water level for three consecutive readings.**
   - **Temperature (˚C)** +/- 1º C
     Values are typically rounded to the nearest whole number (e.g., 10.4 is rounded to 10, whereas 10.5 is rounded to 11).
   - **Specific Conductivity (**µS/cm ) +/-**3%**
     Values are typically rounded to the nearest whole number.
   - **DO** +/-**10% for values greater than 0.5 mg/l**,
     Values are typically rounded to the nearest tenth place number.
     Values between 0.5 and 1.0 are typically considered stable within +/- 0.1 mg/L.
     Values less than zero point five (0.5) are typically reported as <0.5.
     If three consecutive DO values are less than 0.5 mg/l, consider the values stabilized.
   - **pH +/- 0.1 unit**
     Values are typically rounded to the nearest tenth place number.
   - **ORP +/- 10 millivolts**
     Values are typically rounded to the nearest whole number.
   - **Turbidity** +/-**10% for values greater than 5 NTU**
     Values are typically rounded to the nearest whole number.
     Values between 5 and 10 are typically considered stable within +/- 1 NTU.
     Values less than five (5) are typically reported as <5.
     If three consecutive turbidity values are less than 5 NTU, consider the values stabilized.

2. Purge Volume Requirement

   **If the drawdown is less than 0.3 feet,** purging is considered complete and sampling may begin when all the above indicator field parameters have stabilized.

**If the drawdown has exceeded 0.3 feet and stabilizes**, calculate the volume of water between the initial water level and the stabilized water level. The Final Purge Volume (FPV) must be greater than the stabilized drawdown volume plus the pump's tubing volume. This combined volume of water needs to be purged from the piezometer after the water level has stabilized before samples are collected. Document all purge volume calculations on the field worksheet.

FPV = (Total Tubing Length x Tubing Capacity) + (Total Drawdown x Piezometer Capacity)

**NOTE**: Include the length of tubing that is outside the piezometer to the Total Tubing Length.

Tubing Capacity Values

| **Tubing Diameter (inches)** | ¼ - inch (0.25) OD **(0.17 in ID)*** | 3/8 - inch (0.375) OD **(0.25 in ID)*** | 1/2 - inch (0.50) OD **(0.375 in ID)*** | 5/8 - inch (0.625) OD **(0.50 in ID)*** |
|---|---|---|---|---|
| Volume (gal/foot) | 0.0012 | 0.0026 | 0.0057 | 0.0102 |

Piezometer Capacity Values

| **PVC/Inner Casing ID* (inches)** | 1.25 | 1.5 | 1.75 | 2 | 2.25 | 3 | 3.5 | 4 | 6 |
|---|---|---|---|---|---|---|---|---|---|
| Volume (gal/ft) | 0.06 | 0.09 | 0.12 | 0.16 | 0.21 | 0.63 | 0.5 | 0.65 | 1.47 |

* Calculations are based on the inside diameter (ID).

Once the purge volume requirement has been met and the water level and the indicator parameters have stabilized, the piezometer is considered ready for sample collection.

3. Sample Collection

Samples for laboratory analyses must be collected before the flow cell and the 3-way stopcock. This will be done by disconnecting the flow cell and the 3-way stopcock so that the samples are collected directly from the pump tubing.

Make sure that all sample containers are properly labeled. Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. Sample containers should be wiped dry and placed in re-sealable plastic bags.

During purging and sampling, the centrifugal/peristaltic pump tubing must remain filled with water to avoid aeration of the groundwater. It is recommended that 1/4-inch (inside diameter) tubing be used to help insure that the sample tubing remains water filled. If the pump tubing is not completely filled to the sampling point, use the following procedure to collect samples: collect non-VOC/dissolved gases samples first, then increase flow rate slightly until the water completely fills the tubing, collect the VOC/dissolved gases samples, and record new drawdown depth and flow rate.

Use pre-preserved sample containers or add preservative, as required by analytical methods, to the samples immediately after they are collected. Check the analytical methods (e.g., EPA SW-846, 40 CFR 136, water supply, etc.) and the lab for additional information on preservation.

Field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples should be collected by filling a separate container for each analysis immediately following the actual field sample collection (e.g., original, duplicate, MS/MSD)

Samples requiring cooling will be placed into a cooler **in double-bagged ice** for delivery to the laboratory.

7. Post Sampling Activities

Record the total purged volume (graduated bucket).

Remove the pump and tubing from the piezometer, unless dedicated. Dedicated pump and tubing should be secured to the inside of the piezometer. Non-dedicated tubing should be discarded.

If not previously measured, measure and record the depth of the piezometer (to 0.1 ft.) as required in the SAP. More information on measuring piezometer depths is located under Preliminary Procedures.

Secure the piezometer with the locking cap.

Decontaminate any non-dedicated equipment according to the Decontamination SOP in the SAP.

**QUALITY ASSURANCE SAMPLES**

Collect appropriate quality assurance samples as specified in the site-specific SAP. At a minimum, at least one duplicate, one MS/MSD, and one field blank (for PFAS) should be collected per 20 samples. Duplicate samples are collected by filling a separate container for each analysis immediately following the actual field sample collection and should be in the same priority order as indicated in the SAP. Duplicate samples are typically not intended to be blind duplicate samples.

Equipment blanks should be collected on non-disposable equipment to ensure that the equipment is clean and the decontamination procedure is adequate (e.g., syringes, glass or stainless steel containers, etc.).

**DECONTAMINATION**

Decontaminate equipment according to GZA SOP A10: *Decontamination Procedure*. Disposable sampling equipment shall be discarded after completing the sampling task and not reused.

**RECORDS AND DOCUMENTATION**

In general, all data and sampling information will be documented as recorded as specified in the SAP. Specific reporting of these sampling events may include, but is not limited to, the following information:

1. Samples collected.
2. Date and time of sample collection.
3. Water depths at the sampling locations.
4. Any water quality parameter readings taken.
5. General physical description of the samples and sampling locations.
6. Digital photographs of sampling locations including one or more of the larger surrounding area, along with any notes on the photographs.

**SPECIAL NOTES**

None.

**APPLICABLE STANDARDS AND REFERENCES**

U.S. Environmental Protection Agency, region 4, Science and Ecosystem support Division, *Standard Operating Procedure SESDPROC-513-R3*, December 14, 2016.

**ATTACHMENT**

Piezometer Sampling Worksheet

## Attachment A – Piezometer Sampling Worksheet

**Date:** **Location ID:**

**Weather Conditions:** **Sampler's Name:**

**Water Depth (ft):** **Piezometer Screen Interval (ft) (below water surface)**

**Sediment Thickness (ft) (est):**

**Start time** **Sample Time**

| Time | Water Level (ft) | Drawdown (ft) | Purge Rate (ml/min) | Temp (°C) | Specific Conductance (us/cm) | pH (SU) | DO (mg/L) | ORP (mV) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| Time | Water Level (ft) | Drawdown (ft) | Purge Rate (ml/min) | Temp (°C) | Specific Conductance (us/cm) | pH (SU) | DO (mg/L) | ORP (mV) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

GZA GeoEnvironmental, Inc.