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

Sent Via Email: odonnelld@michigan.gov

August 11, 2017
File: 16.0062335.52

Mr. David O'Donnell
Michigan Department of Environmental Quality
5th Floor – Unit 10
350 Ottawa Avenue NE
Grand Rapids, MI 49503

Re: Wolverine World Wide, Inc. – Groundwater Wells at
House Street and Herrington Avenue, Plainfield Township, Kent County, Michigan

Dear Mr. O'Donnell:

Rose & Westra, Inc. a Division of GZA GeoEnvironmental, Inc. (R&W/GZA) is pleased to submit this conceptual scope of work to install groundwater monitoring wells at Wolverine World Wide's (Wolverine's) land commonly known as 1855 House Street NE, Plainfield Township, Kent County, Michigan and referred to as House & Herrington (the Site).

PURPOSE

The purpose of the investigation will be to assess groundwater quality near the perimeter of the Site, estimate horizontal and vertical groundwater flow directions, and provide geological information for the Site.

FIELD PREPARATION ACTIVITIES

R&W/GZA proposes the following field preparation activities.

- Prepare a project-specific Health and Safety Plan (HASP) in accordance with 29 CFR 1910.120 (*Hazardous Waste Operations and Emergency Response Act*). The project-specific HASP will describe known and potential risks applicable to the work and methods to protect workers from both physical and chemical hazards while conducting the work. The HASP will be available for informational purposes to our subcontractors, the Michigan Department of Environmental Quality (MDEQ), and Client personnel prior to initiating the work.
- Secure contracts with subcontractors for drilling, laboratory, and surveying services.
- R&W/GZA will request underground utility marking by public utility location services.
- R&W/GZA will obtain information from Wolverine or its representatives about utility easements/rights-of-way which may encumber the Site.

SCOPE OF WORK

The scope of work will include the following items.

- Survey potable water wells near the Site (for elevation only) and construct regional geological cross sections to predict geological conditions at and near the Site. This task is underway.
- Perform approximately 7 soil borings and install approximately 17 permanent groundwater monitoring wells (described in more detail below). The final number of borings and their locations will be determined by the geological cross sections, residential well testing results, and ability to access the proposed location with the drill rig and supporting equipment.
- Develop and sample the monitoring wells for several general chemistry analytes, perfluoro alkyl substances (PFAS), several metals, selected anions, the inorganic nitrogen series, and volatile organic compounds (VOCs).
- Draft a report summarizing the field activities and results including well logs, geological cross sections, analytical data summary tables and R&W/GZA's interpretation of this information.

Task 1 – Prepare Regional Geological Cross Sections – Preliminary CSM

R&W/GZA will construct geological cross sections using residential water well logs and topographic information from the Kent County online parcel viewer. The cross sections and residential well test results will be used to propose boring locations and their depths. This information and historical aerial photographs will be used to create a preliminary Conceptual Site Model (CSM; per ASTM International E1689-95 [2014]). The CSM will be used to assess the number of soil borings and optimize their placement. R&W/GZA will meet with your team to discuss this information and select "final" boring locations.

Task 2 – Drilling and Well Installation

R&W/GZA will secure a subcontracted drilling company to complete the well installation and development. Based on the likely presence of two, potentially three, aquifers at the Site, this will include installing the following:

- Approximately seven monitoring wells into the deeper aquifer, assumed 150 feet (ft) below ground surface (bgs);
- Approximately seven wells into the shallow aquifer, assumed 75 ft bgs; and
- If an even more shallow confined aquifer is identified (likely 30 ft bgs or less), monitoring wells will be installed in this formation.

Subject to Task 1, we presume two monitoring wells will be clustered at most locations.

All wells will be drilled using an ATV-mounted rig using hollow-stem augers. The soil will be continuously sampled and logged while performing the seven deep soil borings. Soil will be collected and logged while installing the shallow and intermediate depth wells at the deepest portions of the borings to confirm installation is in the correct formation. All soil cuttings will remain at the ground surface near the well installation locations.

All wells will be 2-inch diameter and constructed using PVC piping and screens without PFAS-containing construction materials. The wells will be finished with a concrete pad and above grade locking wells casing. The driller will develop the monitoring wells after installation. All development water will be placed on the ground near the well.

A surveyor will complete a boundary survey, locate all the wells, and measure ground and top of casing elevations for all monitoring wells. R&W/GZA will measure water levels in the monitoring wells.

R&W/GZA will allow the monitoring wells to "rest" for at least 14 days prior to sampling.

Task 3 – Sampling

Because PFAS are commonly used in commercial products and widely distributed in the environment, R&W/GZA staff will use site-specific sampling procedures to minimize the likelihood for cross-contamination. These procedures will include:

- Using a two-man sampling crew ("clean hands-dirty hands");
- Avoiding plastic clothing and booties, personal care products, sun screen, markers, waterproof paper, fast food wrappers, aluminum foil, and other consumer products known to contain PFAS or PFAS-based polymers;
- The "clean hands" sampler will wear nitrile-based gloves (changed between samples) and older clothing which had been laundered and air dried (except for boots and belt);
- All sampling equipment will be Teflon®-free.

ALS Group USA's Kelso, Washington (ALS) laboratory will supply sampling bottles and associated supplies. The bottles include a preservative.

Because the test method can detect PFAS concentrations at nanograms per liter (ng/l; approximately parts per trillion) and PFAS are routinely found in the environment in these concentrations, R&W/GZA will collect one field blank each day. The field blank will be shipped from ALS and then transferred to a sampling bottle in the field. The field blank will assess potential sampling/transportation artifacts (i.e., false positive results, compounds which may have been introduced into the residential well samples during the sampling, and transportation process).

ALS will use a modified U.S. EPA Method 537 to test for PFAS. Michigan Department of Health and Human Services had requested ALS use modified Method 537 to test for additional compounds for the residential well testing.

Samples will also be collected from each well for VOCs, metals (total chromium, hexavalent chromium, aluminum, barium, boron, cadmium, copper, iron, lead, manganese, silver, thallium, vanadium, and zinc), and general chemistry (nitrate/nitrite, ammonia, sodium, potassium, calcium, magnesium, chloride, sulfate, and alkalinity) analyses. The groundwater samples will be collected in appropriate sample containers, labeled, and placed in a chilled cooler under chain-of-custody procedures for laboratory analysis according to MDEQ Remediation and Redevelopment Division *Operational Memorandum No. 2, Attachment 5* (2004). The groundwater samples for non-PFA analysis will be bid to multiple laboratories. We estimate 17 investigative samples, five field blanks, and five duplicate samples will be collected and analyzed. The proposed metallic analytes are based on the findings from the investigation at Wolverine's Rockford, Michigan tannery.

Task 4 – Results and Interpretation

The following interpretative tasks will be completed once the field work and sample analysis have been completed.

- Static water levels will be measured at least twice during the investigation and used to estimate the groundwater flow direction(s) on the Site.

- Soil boring logs and well installation diagrams will be prepared.
- Geological cross sections will be amended. The locations will be determined based on the geology encountered during the drilling process and depths of identified groundwater formations.
- Revise the CSM as appropriate.
- The analytical results will be summarized in tables compared to existing Michigan Part 201 cleanup criteria. In the case of PFAS, the data table will include U.S. EPA's lifetime drinking water advisory concentrations if applicable. These screening levels will be presented, because enforceable drinking water criteria (Maximum Contaminant Levels or Michigan Part 201 cleanup criteria) have not been promulgated for any PFAS.
- The groundwater chemistry will be described at the various locations and depths.
- A Site plan showing the well locations as well as the suspect former disposal areas will also be prepared.
- A summary report including the above-listed items and data interpretation will be completed. A draft of the report will be provided to the client and counsel for review prior to issuing the final document.

SCHEDULE

R&W/GZA has commenced creating the geological cross sections and associated information. We have tentatively scheduled drilling to commence on Tuesday, September 5, 2017. We anticipate the investigation and report will take approximately 90 days to complete.

We will contact you once we have the preliminary information to propose the boring locations.

Sincerely,

Rose & Westra, a Division of GZA GeoEnvironmental, Inc.

Loretta J. Powers
Project Manager

Mark A. Westra
Associate Principal

ljp/maw/jac

c: Mr. Dave Latchana – Wolverine World Wide, Inc. *via emal David.Latchana@wwwinc.com*
Mr. John V. Byl – Warner Norcross & Judd LLP *via email jbyl@wnj.com*

\\gzagr1\jobs\62000\623xx\62335.50 www house street\well scope-estimate\house-proposal-well-installation_f.docx