Rose & Westra
A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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April 18, 2022
File No.: 16.0062335.20

Ms. Karen Vorce
Remediation and Redevelopment Division
Michigan Department of Environment, Great Lakes, and Energy
350 Ottawa Avenue NW, Unit 10
Grand Rapids, MI 49503-2341

Re: Work Plan – Wolverine World Wide, Inc.
485 Wolverine Drive, NE, Rockford, Michigan

Dear Ms. Vorce:

Rose & Westra, a division of GZA GeoEnvironmental, Inc. (R&W/GZA), is submitting this Work Plan on behalf of Wolverine World Wide in response to your letter dated March 2, 2022 regarding the property at 485 Wolverine Drive, NE, Rockford, Michigan (Site). The purpose of this Work Plan is to obtain additional information regarding the potential per- and poly-fluoroalkyl substances (PFAS) in groundwater at the Site. There is no known source of PFAS and this evaluation is in the preliminary stages.

BACKGROUND

The Site is currently inactive and was most recently used for storage. Historically, the Site was used for footwear assembly and sole production. In December 2021, Michigan Department of Environment, Great Lakes and Energy (EGLE) conducted groundwater sampling in five locations (EGLE-GW-01, EGLE-GW-02, EGLE-GW-04, EGLE-GW-05, and EGLE-GW-06) at the Site. Samples were analyzed for PFAS and the results identified PFAS compounds in the groundwater above the EGLE Part 201 Generic Cleanup Criteria. **Figure 1** shows the sample locations and **Table 1** provides the analytical results from EGLE.

OBJECTIVES

Objectives of this scope of work are:

- Confirm whether initial PFAS sample results were representative of actual conditions by resampling groundwater;
- Further evaluate groundwater quality, including the installation of permanent piezometers and wells where previous sampling occurred and at upgradient locations on-Site; and,
- Conduct preliminary investigation activities to look for leather scraps on the property in the areas which had more elevated PFAS concentrations in groundwater.

SCOPE OF WORK

GZA proposes the following Scope of Work.

Task 1: Piezometer Installation and Groundwater Sampling

Piezometers EGLE-GW-05 and EGLE-GW-06 were removed by EGLE in January 2022. R&W/GZA will install permanent piezometers in these locations. Additionally, two monitoring wells will be installed along the east (upgradient) side of the property, one at the north end and one at the south end. The primary objective of the piezometer and monitoring well installation program will be to provide sampling locations to further evaluate groundwater quality. **Figure 1** presents the existing and proposed piezometer and monitoring well locations.

A survey of the location and elevation of ground surface at each of the piezometer and monitoring well locations will be completed by a surveyor licensed by the State of Michigan. The top of the polyvinyl chloride riser of each monitoring well will be included in the survey to provide a reference point elevation for the calculation of groundwater/hydraulic head elevation. Monitoring well and piezometer locations will be surveyed to an accuracy of <1 foot; ground surface elevations will be determined to an accuracy of 0.1 foot; piezometer/well elevations will be determined to an accuracy of 0.01 foot.

Once these installations are complete, the new piezometers and monitoring wells will be sampled along with existing monitoring wells EGLE-GW-01 and EGLE-GW-02.

One round of groundwater samples will be collected from the monitoring wells and piezometers referenced above. Sampling of newly installed monitoring wells and piezometers will be performed a minimum of two weeks following installation and development.

R&W/GZA will collect groundwater samples following the "Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells," by U.S. Environmental Protection Agency (EPA), Region I, Revision 4, dated September 19, 2017 (EPA Region I, 2017). Refer to the Quality Assurance Project Plan (QAPP[1]) for detailed sampling procedures, sample preservation, sample packaging, chain-of-custody, field quality assurance (QA) and Quality Control (QC) sample requirement, and laboratory QA/QC requirements. Samples will be analyzed for PFAS. 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 QAPP.

Soil cuttings generated during well installation will be spread on-Site. Purge water will be discharged to the ground surface per guidelines in EGLE (formerly Michigan Department of Environmental Quality) Operational Memorandum GEN-10 dated May 14, 1999.

R&W/GZA will also install and survey two staff gauges in the Rogue River adjacent to piezometers EGLE-GW-05 and EGLE-GW-06 to provide additional data regarding surface water elevations.

Task 2: Test Digs

R&W/GZA did a preliminary surface evaluation to identify potential scraps on-Site during the first quarter 2022. No scraps were identified at that time. R&W/GZA will investigate for potential on-Site leather scraps by conducting three to eight test digs to 2 to 3 feet below ground surface using hand digging techniques. Test digs will be limited to the portions of the property south of the parking lot near EGLE-GW-02. Conditions will be documented on a test dig log.

[1] QAPP: Quality Assurance Project Plan [*Former Wolverine Tannery, House Street Disposal Area, and Wolven/Jewell Area, Per- and Polyfluoroalkyl Substances Investigation Program*], dated November 1, 2018; Revision June 2021.

Task 3: Data Evaluation

R&W/GZA will evaluate the information and data collected during this scope of work and prepare a letter report including figures and tables summarizing the information collected and results of groundwater sampling and analyses. A summary of the visual observations from the test pits will also be included.

SCHEDULE

The tasks in this Work Plan are expected to commence during second quarter 2022.

Please contact us at 616-258-7222 with any questions.

Sincerely,

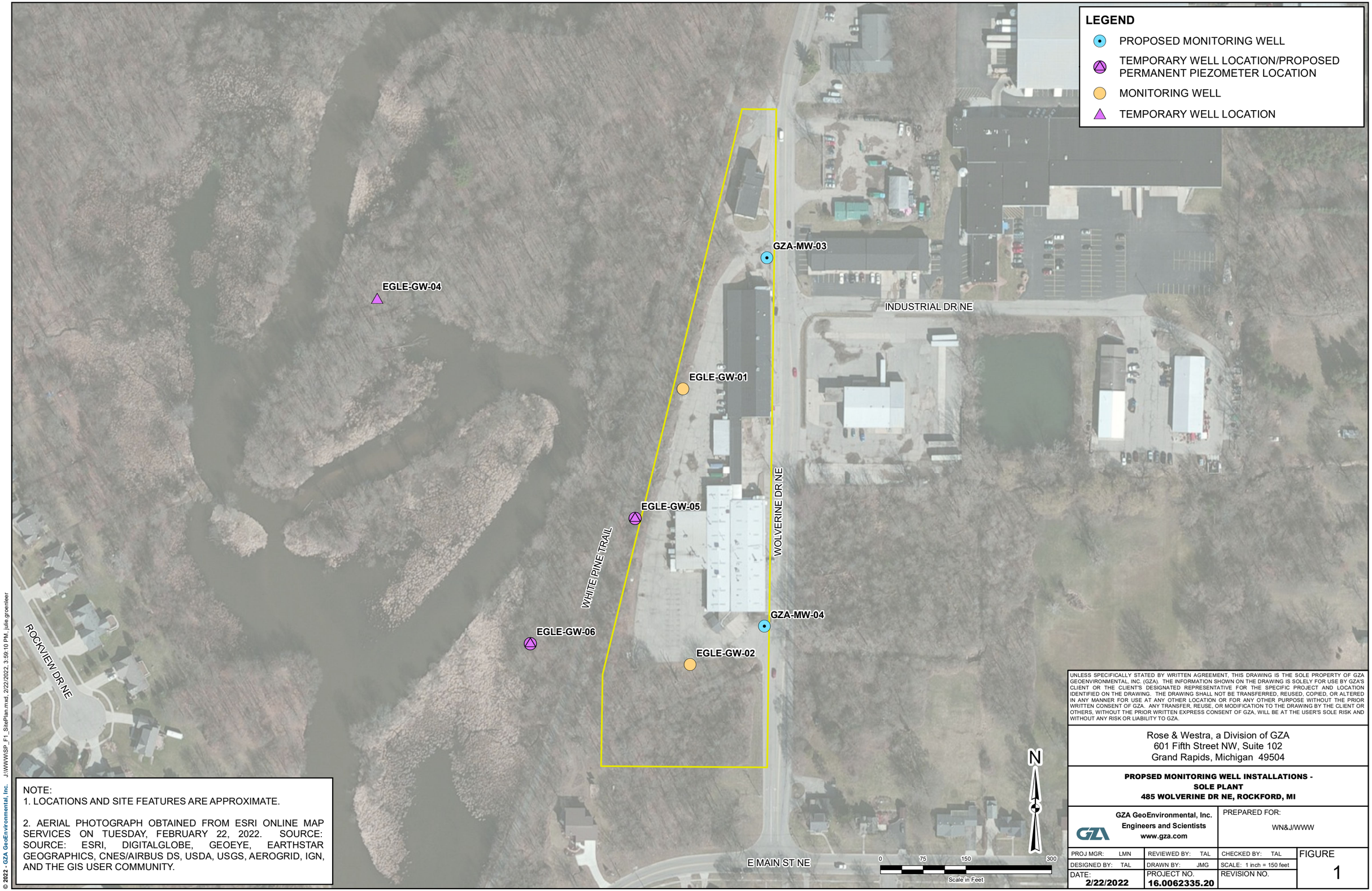
Leslie M. Nelson
Associate Principal

Mark A. Westra
Principal

lmn/maw

Attachments: Figure 1
Table 1 – Summary Of Groundwater Sample Analysis

FIGURE



NOTE:
1. LOCATIONS AND SITE FEATURES ARE APPROXIMATE.

2. AERIAL PHOTOGRAPH OBTAINED FROM ESRI ONLINE MAP SERVICES ON TUESDAY, FEBRUARY 22, 2022. SOURCE: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

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

PROPSED MONITORING WELL INSTALLATIONS - SOLE PLANT
485 WOLVERINE DR NE, ROCKFORD, MI

GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: WN&J/WWW	
PROJ MGR: LMN	REVIEWED BY: TAL	CHECKED BY: TAL	FIGURE 1
DESIGNED BY: TAL	DRAWN BY: JMG	SCALE: 1 inch = 150 feet	
DATE: 2/22/2022	PROJECT NO. 16.0062335.20	REVISION NO.	

TABLE

TABLE 1
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
485 Wolverine Dr NE
Rockford, MI

Collector	Part 201 Generic Residential Groundwater Cleanup Criteria - Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria - Groundwater Surface Water Interface[2]	R&W/GZA	EGLE	R&W/GZA	EGLE	R&W/GZA	EGLE
Location			EGLE-GW-01	EGLE-GW-01	EGLE-GW-02	EGLE-GW-02	EGLE-GW-04	EGLE-GW-04
Sample Name			EGLE-GW-01	GW2112010940JLB	EGLE-GW-02	GW2112011140JLB	EGLE-GW-04	GW2112021025JLB
Laboratory Sample ID			WL03030-001	2112038-01	WL03030-002	2112038-02	WL03030-005	2112038-06
Sample Date			12/01/2021	12/01/2021	12/01/2021	12/01/2021	12/02/2021	12/02/2021
Parameter (µg/L)								
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NCL	NCL	<0.0072	<0.00203	<0.0074	<0.00206	<0.0095	<0.00203
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUdS)	NCL	NCL	<0.0072	<0.00203	<0.0074	<0.00206	<0.0095	<0.00203
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NCL	NCL	<0.0072	<0.00203	<0.0074	<0.00206	<0.0095	<0.00203
1H,1H,2H,2H-perfluorohexane sulfonate (4:2FTS)	NCL	NCL	<0.0072	<0.00203	<0.0074	<0.00206	<0.0095	<0.00203
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	<0.0072	<0.00203	<0.0074	<0.00206	<0.0095	<0.00203
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	<0.0072	<0.00203	<0.0074	<0.00206	<0.0095	<0.00203
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NCL	<0.0072	0.00209 [J]	0.016	0.0141	<0.0095	<0.00203
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NCL	<0.0072	<0.00203	<0.0074	<0.00206	<0.0095	<0.00203
Perfluorobutane sulfonic acid (PFBS)	0.42 (A)	NA	0.0073	0.00632	0.0097	0.00904	0.069	0.0481
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	<0.0036	<0.00203	<0.0037	<0.00206	<0.0047	<0.00203
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	0.025	0.0248	0.021	0.0199	<0.0047	<0.00203
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	<0.0036	<0.00203	<0.0037	<0.00206	<0.0047	<0.00203
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	<0.0036	<0.00203	0.01	0.0081	<0.0047	<0.00203
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	0.0049	0.00439	0.005	0.00367 [J]	0.0086	0.00653
Perfluorohexane sulfonic acid (PFHxS)	0.051 (A)	NA	0.04	0.0389	0.023	0.0224	0.01	0.00749
Perfluorobutanoic acid (PFBA)	NCL	NCL	0.0061	0.00529	0.0038	0.00312 [J]	0.019	0.0132
Perfluorodecanoic acid (PFDA)	NCL	NCL	<0.0036	<0.00203	<0.0037	<0.00206	<0.0047	<0.00203
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	<0.0036	<0.00203	<0.0037	<0.00206	<0.0047	<0.00203
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	0.011	0.00902	0.0054	0.00448	0.0049	0.00331 [J]
Perfluorohexanoic acid (PFHxA)	400	NA	0.0087	0.00814	0.0043	0.00386 [J]	0.012	0.00775
Perfluorononanoic acid (PFNA)	0.006 (A)	NA	<0.0036	0.00137 [J]	0.0052	0.00393 [J]	<0.0047	<0.00203
Perfluorooctanoic acid (PFOA)	0.008 (A)	12	***0.15***	***0.145***	***0.07***	***0.0683***	***0.046***	***0.0334***
Perfluorooctane sulfonic acid (PFOS)	0.016 (A)	0.012	***0.2***	***0.211 [Q]***	***1.4***	***1.07***	***0.039***	***0.0345***
PFOA + PFOS (Calculated)	NCL	NCL	0.35	0.36	1.5	1.1	0.085	0.068
Perfluoropentanoic acid (PFPeA)	NCL	NCL	0.007	0.00627	<0.0037	0.00161 [J]	0.0064	0.00475
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	<0.0036	<0.00203	<0.0037	<0.00206	<0.0047	<0.00203
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	<0.0036	<0.00203	<0.0037	<0.00206	<0.0047	<0.00203
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	<0.0036	<0.00203	<0.0037	<0.00206	<0.0047	<0.00203
Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (GenX)	0.37 (A)	NA	<0.0072	<0.00203	<0.0074	<0.00206	<0.0095	<0.00203
Total PFAS (Calculated)	NCL	NCL	0.46	0.46	1.6	1.2	0.21	0.16

TABLE 1
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
485 Wolverine Dr NE
Rockford, MI

Collector	Part 201 Generic Residential Groundwater Cleanup Criteria - Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria - Groundwater Surface Water Interface[2]	R&W/GZA	EGLE	R&W/GZA	EGLE
Location			EGLE-GW-05	EGLE-GW-05	EGLE-GW-06	EGLE-GW-06
Sample Name			EGLE-GW-05	GW2112011450JLB	EGLE-GW-06	GW2112011520JLB
Laboratory Sample ID			WL03030-003	2112038-03	WL03030-004	2112038-05
Sample Date			12/01/2021	12/01/2021	12/01/2021	12/01/2021
Parameter (µg/L)						
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	NCL	NCL	<0.0074	<0.00204	<0.009	<0.00202
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUdS)	NCL	NCL	<0.0074	<0.00204	<0.009	<0.00202
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NCL	NCL	<0.0074	<0.00204	<0.009	<0.00202
1H,1H,2H,2H-perfluorohexane sulfonate (4:2FTS)	NCL	NCL	<0.0074	<0.00204	<0.009	<0.00202
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	<0.0074	<0.00204	<0.009	<0.00202
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	<0.0074	<0.00204	<0.009	<0.00202
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	NCL	NCL	0.0075	0.00669	<0.009	0.00322 [J]
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	NCL	NCL	<0.0074	0.00224 [J]	<0.009	<0.00202
Perfluorobutane sulfonic acid (PFBS)	0.42 (A)	NA	0.012	0.011	0.026	0.0189
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	<0.0037	<0.00204	<0.0045	<0.00202
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	0.0044	0.00489	0.028	0.0231
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	<0.0037	<0.00204	<0.0045	<0.00202
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	0.0045	0.00246 [J]	<0.0045	<0.00202
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	<0.0037	0.00146 [J]	0.0063	0.00499
Perfluorohexane sulfonic acid (PFHxS)	0.051 (A)	NA	0.019	0.0177	0.036	0.0258
Perfluorobutanoic acid (PFBA)	NCL	NCL	0.004	0.00209 [J]	0.018	0.0128
Perfluorodecanoic acid (PFDA)	NCL	NCL	<0.0037	0.00193 [J]	<0.0045	<0.00202
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	<0.0037	<0.00204	<0.0045	<0.00202
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	0.0057	0.00465	0.015	0.0111
Perfluorohexanoic acid (PFHxA)	400	NA	<0.0037	0.00228 [J]	0.023	0.017
Perfluorononanoic acid (PFNA)	0.006 (A)	NA	<0.0037	<0.00204	***0.012***	***0.00904***
Perfluorooctanoic acid (PFOA)	0.008 (A)	12	***0.053***	***0.0512***	***0.15***	***0.11***
Perfluorooctane sulfonic acid (PFOS)	0.016 (A)	0.012	***0.17***	***0.179***	***1.7***	***1.25***
PFOA + PFOS (Calculated)	NCL	NCL	0.22	0.23	1.9	1.4
Perfluoropentanoic acid (PFPeA)	NCL	NCL	<0.0037	<0.00204	0.014	0.00981
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	<0.0037	<0.00204	<0.0045	<0.00202
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	<0.0037	<0.00204	<0.0045	<0.00202
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	<0.0037	<0.00204	<0.0045	<0.00202
Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (GenX)	0.37 (A)	NA	<0.0074	<0.00204	<0.009	<0.00202
Total PFAS (Calculated)	NCL	NCL	0.28	0.29	2.0	1.5

TABLE 1 NOTES
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
485 Wolverine Dr NE
Rockford, MI

NOTES:

1. Concentration and criteria units are micrograms per Liter (µg/L) or parts per billion (ppb). Calculated concentrations are rounded to two significant digits.
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; last updated December 21, 2020.
   Abbreviations Include:
   "NCL" indicates no criterion listed in EGLE Table 1.
   "NA" indicates not available.
   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:
   "< LOQ" indicates the parameter was analyzed for but not detected above the limit of quantitation (LOQ).
   "DUP" indicates a duplicate sample.
   "ND" indicates the parameters used in the calculation were not detected.
   "J" indicates the parameter was detected below the LOQ.
   "Q" indicates the ion transition ratio was outside the acceptance criteria.