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MEMORANDUM

To: Abby Hendershott, EGLE

From: Leslie Nelson, Rose & Westra, a Division of GZA GeoEnvironmental, Inc.

Date: May 31, 2019

File No.: 16.0062677.81 Task 001

Re: Wolverine World Wide, Inc. (Wolverine) – Wolven/Jewell RI – Monthly Progress Report

This Monthly Progress Report (MPR) is being provided at the request of EGLE to provide an update regarding the implementation of the December 13, 2017 Source Area Investigation Work Plan (WP) related to per- and polyfluorinated alkyl substances (PFAS) detected in residential wells in the Wolven/Jewell study area.

ACTIONS PERFORMED

During this period, April 24, 2019 through May 24, 2019, GZA has done the following:

1. April 24, 2019 through April 30, 2019: Completed drilling and monitoring well installation at WV-MW-14 location.
2. April 29, 2019 – May 15, 2019 – Conducted groundwater sampling on all wells except WV-MW-14 series.
3. Continued work to obtain access to additional drilling locations.

ANALYTICAL DATA RECEIVED

Data from the vertical profiling at WV-MW-10, WV-MW-14 and WV-MW-16 was received and is included in Table 1.

ANTICIPATED ACTIONS AND SCHEDULE FOR NEXT REPORTING PERIOD

During the next reporting period, May 28, 2019 to June 24, 2019, R&W/GZA anticipates the following activities:

- 1) Install an additional shallow monitoring well at the WV-MW-10 location.
- 2) Continue to work for access to other drilling locations for additional monitoring wells. Conduct additional drilling if access is obtained.





- 3) Complete boring logs for WV-MW-14 and WV-MW-16.
- 4) Survey the newly installed monitoring wells.

TABLE 1
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Wolver/Jewell
Algoma Township, Kent County, Michigan

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface	U.S. EPA Residential Tap Water Regional Removal Management Levels	PMW-WV-10	PMW-WV-10	PMW-WV-10	PMW-WV-10	PMW-WV-10	PMW-WV-14	PMW-WV-14	PMW-WV-16	PMW-WV-16	PMW-WV-16
Sample Name				WV-MW-10 (8-18)	WV-MW-10 (18-28)	WV-MW-10 (26-36)	WV-MW-10 (66-76)	WV-MW-10 (163-168)	WV-MW-14 (9-14)	WV-MW-14 (139-144)	WV-MW-16 (4-14)	WV-MW-16 (12-22)	WV-MW-16 (86-96)
Laboratory Sample ID(s)				UB28083-001	UB28083-002	UB28083-003	UB28083-004	UC21100-001	UD20015-001	UD30028-001	UC23027-001	UC23027-002	UC23027-003
Sample Date				02/25/2019	02/25/2019	02/26/2019	02/27/2019	03/13/2019	04/15/2019	04/24/2019	03/19/2019	03/20/2019	03/22/2019
Parameter (µg/L)													
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	0.006
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	<0.0072	<0.0083	<0.0075	<0.0073	<0.0073	<0.0073	<0.0072	<0.0071	<0.0073	<0.0083
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	1,200	0.0077	<0.0041	<0.0038	<0.0036	0.0059	0.015	<0.0036	0.0083	0.025	<0.0042
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	0.0046	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	<0.0072	<0.0083	<0.0075	<0.0073	<0.0073	<0.0073	<0.0072	<0.0071	<0.0073	<0.0083
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	0.006	<0.0037	<0.0036	<0.0036	0.006	<0.0042
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	0.0098	<0.0041	<0.0038	<0.0036	<0.0036	0.0062	<0.0036	<0.0036	0.011	<0.0042
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	0.01	0.059	<0.0042
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	0.019	<0.0042
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	0.0042	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	0.0083	0.055	<0.0042
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	NCL	0.023	<0.0021	<0.0019	<0.0018	0.0045	0.011	<0.0018	0.01	0.054	0.0024
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NCL	0.31	0.0082	<0.0038	<0.0036	<0.0036	0.0059	<0.0036	0.021	0.066	<0.0042
PFOA + PFOS (Calculated)	0.07	NCL	NCL	0.33	0.0082	ND	ND	0.0045	0.017	ND	0.031	0.12	0.0024
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	0.0043	0.026	<0.0042
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	<0.0036	<0.0041	<0.0038	<0.0036	<0.0036	<0.0037	<0.0036	<0.0036	<0.0037	<0.0042
Total PFAS (Calculated)	NCL	NCL	NCL	0.36	0.0082	ND	ND	0.016	0.038	ND	0.062	0.32	0.0084

TABLE 1
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
Wolven/Jewell
Algoma Township, Kent County, Michigan

NOTES:

1. Concentration and criteria units are micrograms per Liter ($\mu\text{g/L}$) 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 June 25, 2018.
Abbreviations Include:
"NCL" indicates no criterion listed in Michigan Department of Environment, Great Lakes, and Energy (EGLE) Table 1.
"NLV" indicates the substance is not likely to volatilize under most conditions.
Footnotes Include:
(JJ) - Compliance with the drinking water criteria shall require comparing the sum of the PFOA and PFOS groundwater concentrations to the drinking water criterion of $0.07 \mu\text{g/L}$.
3. U.S. EPA Residential Tap Water Regional Removal Management Levels (RMLs) were based on "Generic RML Tables," updated November 2018.
4. Bold, italic number with thick line border or italic parameter name indicates that parameter was detected above the Michigan Part 201 Groundwater Cleanup Criteria or Media-Specific Interim Action Screening Levels. U.S. EPA RMLs are provided for reference only and results detected above the EPA RMLs are not bolded or italicized.
5. Abbreviation includes:
"< RL" indicates the parameter was analyzed for but not detected above the method detection limit; RL = Reporting Limit.