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Subject: GETS Pre-Startup Monitoring Data Package Addendum
Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI

Dear Ms. Sellwood,

On behalf of Tyco Fire Products LP (Tyco), Arcadis is providing this addendum to the July 15, 2022 data package for Groundwater Extraction and Treatment System (GETS) pre-startup monitoring activities related to the Tyco Fire Technology Center (FTC) per- or polyfluoroalkyl substances (PFAS) site located at 2700 Industrial Parkway South in Marinette, Wisconsin (Site).

This addendum has been prepared in response to comments received from Wisconsin Department of Natural Resources (WDNR) on August 24, 2022 and is being submitted in accordance with NR 724.13(3) and NR 724.17(3m).

This addendum includes the following components:

- Monitoring well construction and development forms for MW-EX-2, MW-EX-3, MW-EX-4, and MW-EX-5
- A summary of the Ditch B staff gauge/benchmark measurements
- Transducer data for the Ditch B Treatment System
- Revised Table 4 (addition of the water level measurement collected from PZ-1S on April 5, 2022)
- Revised Figures 5 and 6

In addition, responses to WDNR comments to the July 15, 2022 data package are presented below.

- WDNR Comment: Verify if MW-EX-2 has a 10-foot well screen, and if so, provide a description as to why.

MW-EX-2 has a 10-foot screen. Immediately following construction of Extraction Well 2 (EX-2), an unscheduled, preliminary pumping test was conducted at the extraction well. To support this preliminary pumping test, MW-EX-2 was installed using supplies (which included a 10-foot screen) the driller had available on-site. MW-EX-2 was intended to be a temporary installation and the plan was to abandon the well after completing the pump test. Once installed, it was decided to leave MW-EX-2 in place for potential future data collection needs.

- WDNR Comment: The continuous pressure transducer data for Ditch B in Figure 4 is incomplete.

All transducer data collected through April 2022 were included within the original submittal July 15, 2022 and are provided in the attached addendum. No transducer data were collected at locations U10 and M09 during the winter months. The stilling wells and transducers were removed from the ditch on November 21, 2021 to prevent damage as a result of ice accumulation. In anticipation of GETS startup, the stilling wells were reinstalled and the transducers were placed back into the stilling

wells at locations U10 and M09 in May 2022. Data collected after reinstallation will be provided in forthcoming startup phase reports.

For location M09, there are no transducer data from July 5 through July 14, 2021, as the transducer was knocked down due to debris in the ditch. The stilling well and transducer were reinstalled more securely on July 14 and data collection resumed.

- WDNR Comment: Include a statement on how the transducer data are correlated to stage/elevation.

The following statement has been added to the hydrograph figures: The data collected from each transducer provide the water depth at the transducer collected hourly. These data are then compared to manual measurements taken from the surveyed reference point and converted to a water level elevation.

- WDNR Comment: Include the stage/elevation measured at the Ditch Treatment System where flow rate is determined.

Transducer data from the Ditch B treatment system have been added to Figure 4. Note that transducer data at the Ditch B treatment system are provided beginning on July 1, 2021. The data prior to this date may be affected by the treatment system intake depressing the surface water elevation and thus may be biased low. The transducer location was moved upstream in July and then further upstream in October to minimize the impacts of the treatment system intake on stage/elevation measurements. Because of this uncertainty, the water elevations from SG-L09 prior to July 1, 2021 are not used to evaluate natural water elevation.

- WDNR Comment: Evaluate and provide explanation for the cause and significance of the discrepancy in PFAS concentrations in groundwater collected from permanent monitoring well PZ-55-64 and groundwater collected via vertical aquifer profiling (VAP) in the same location from approximately the same interval.

The higher PFAS concentrations detected in the August 2021 VAP sample [SB-PZ-55 (59-64 ft)] are interpreted to be representative of the highest concentrations present in groundwater in the area of EX-8, which is screened across this same interval. The result is consistent with the highest concentrations observed both upgradient (e.g., PZ-3) and down-gradient (e.g., PZ-52-41). VAP and monitoring well sampling results throughout the plume also show that these zones of highest concentrations occupy a narrow portion of the aquifer. High concentrations are not broadly dispersed throughout the saturated thickness of the aquifer. Zones with vastly different concentrations may be present in close proximity, as was shown at SB-PZ-55 where the PFOA in the 50-55 ft sample was 3.1 ng/L, but 51,000 in the 59-64 ft sample.

These observations indicate that flow through the aquifer conforms to a complex network of interconnected pathways, likely following higher-permeability deposits. Under these conditions, changes in the hydraulic gradient may cause flow to shift from one pathway to another. At plume-scale these changes likely have little effect on mass transport. However, individual wells may have dramatic changes in concentrations, as the high-concentration pathways continually shift through seasonal changes in the gradient. In that context, the difference between the high concentrations in the August 2021 VAP sample [SB-PZ-55 (59-64 ft)] and the much lower concentrations detected in PZ-55-64 in April 2022 is consistent with aquifer heterogeneity, recognizing that it has both spatial and temporal components.

Alyssa Sellwood, P.E.
WDNR
September 23, 2022

When the GETS becomes operational, seasonal changes and the complex geometry of transport pathways will no longer be relevant. The system is designed to extract enough groundwater to fully capture all transport pathways within its operating area. Once the GETS is operational, the concentrations at observation wells like PZ-55-64 will not be relevant for evaluating nature and extent of PFAS concentrations, because the pathways to those wells will be strongly biased by pumping at the adjacent extraction wells. The intended role of PZ-55-64 is nearfield water-level monitoring of EX-8, which is located 15 feet away. The primary data to be monitored to understand how concentrations near EX-8 are changing will be the concentration and mass-removal trends from EX-8 as it operates. These data will be collected as a routine component of the GETS monitoring program. No additional monitoring to evaluate concentration trends at PZ-55-64 is planned.

- WDNR Comment: The DNR recommends collecting a PFAS sample at or around the start of pumping from each extraction well.

All extraction wells were sampled for PFAS on September 16, 2022. Validated sample results will be provided to WDNR in a report during the startup phase of monitoring.

Please do not hesitate to call us if you have any questions.

Sincerely,
Arcadis U.S., Inc.



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Project Communications Manager

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Enclosures:

Tables

- 4 GETS Baseline Groundwater Elevation Data (Revised)
- 9 Benchmark/Staff Gauge Water Level Measurements (New)

Figures

- 4a Transducer Hydrographs and Ditch B Flow Rates (Revised)
- 4b Transducer Hydrographs and Ditch B Flow Rates (New)
- 5 Potentiometric Surface In Shallow Sand – April 5, 2022 (Revised)
- 6 Potentiometric Surface In Deep Sand – April 5, 2022 (Revised)

Attachments

- 1 Soil Boring Logs, Well Construction Logs, and Well Development Logs (EX-MW2 through EX-MW5)