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July 31, 2025

MS. DENICE NELSON
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5757 N. GREEN BAY AVENUE
MILWAUKEE, WI 53209

Via Email Only to denice.karen.nelson@jci.com

SUBJECT: Response to *GETS Short-Term Monitoring Report #5* (Nov. 14, 2022 – May 11, 2025)
JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI
BRRTS #02-38-580694

Dear Ms. Nelson:

On June 16, 2025, the Wisconsin Department of Natural Resources (DNR) received the *GETS Short-Term Monitoring Report #5* ("GETS Progress Report #5") for the above-referenced site (the "Site"). The report was submitted by Arcadis U.S., Inc. (Arcadis) on behalf of Johnson Controls, Inc. and Tyco Fire Products LP (JCI/Tyco) and was accompanied by the fee required under Wisconsin Administrative Code (Wis. Admin. Code) § NR 749.04(1) for DNR review and response.

GETS Progress Report #5 demonstrates that the Groundwater Extraction and Treatment System (GETS) effectively treats the groundwater it captures but additional actions are needed to restore the environmental to the extent practicable and control contaminant migration at the Site (Wis. Stat. § 292.11(3)). JCI/Tyco is updating the GETS based on these findings; JCI/Tyco should continue to submit semi-annual progress reports while the GETS is being optimized (Wis. Admin. Code § NR 724.13(3)). In this letter, the DNR reviews GETS Progress Report #5 and provides recommendations for future semi-annual progress reports.

Background

JCI/Tyco is investigating and responding to the discharge of per- and polyfluoroalkyl substances (PFAS) to the environment at the JCI/Tyco Ansul Fire Technology Center (FTC), located at 2700 Industrial Parkway South in Marinette, Wisconsin.

A significant groundwater contaminant plume of PFAS is present at the Site; the concentrations of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) in groundwater on the FTC property are on the order of 10,000 – 100,000 parts per trillion (ppt). The contaminated groundwater migrates eastward and some upwells into the surface water ditches; all of which contribute to PFAS migrating to the Bay of Green Bay.

In Nov. 2022, JCI/Tyco began operating the GETS with stated goals to (1) reduce upwelling of PFAS-contaminated groundwater into Ditch B; (2) treat the recovered groundwater to reduce the PFAS concentration in the water; and (3) reduce PFAS-mass flux throughout groundwater plume.

Originally, the GETS included nine vertical groundwater extraction wells to pump and convey contaminated groundwater through buried pipes to a treatment building on the FTC property. Treatment includes oxidation, filtration, granular activated carbon (GAC) and ion exchange resins to remove PFAS from the groundwater. The treated water is discharged back to Ditch B surface water downstream of where the ditch crosses Pierce Avenue[1].

[1] The discharge of treated water to Ditch B is done under a Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit No. WI-0046566-07-0 and the associated coverage letter dated Oct. 15, 2021. The DNR's Wastewater Program administers the WPDES permit.

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Summary and DNR Review of GETS Progress Report #5

The GETS began operating in Nov. 2022. This is the fifth semi-annual progress report submitted under the current-approved monitoring program (Wis. Admin. Code § NR 724.13(3)). A summary of the DNR's understanding of the operation and performance of the GETS is provided in **Attachment A**.

Based on the finding from the performance monitoring to date, JCI/Tyco has taken steps to increase the extraction and treatment capacity GETS and has proposed an updated long-term monitoring program.

GETS Optimization

Previously, JCI/Tyco installed replacement extraction wells EX-1S and EX-2S and updated infrastructure for extraction wells EX-3 and EX-4 to improve ability to treat for biofouling. These efforts increased and stabilized pumping rates in these wells and improved performance of the GETS at these locations.

More recently, JCI/Tyco installed four new extraction wells (EX-10 to EX-13), converted shallow bedrock monitoring well PZ-64-67 to an extraction well (EX-14) and increased the maximum treatment capacity from 275 to 600 gallons per minute (gpm). JCI/Tyco is also proposing to install a new extraction well EX-15 near extraction well EX-6 to increase pumping rates in this area (see Figures 8, 9 and 13). These changes are intended to increase the extraction of contaminated groundwater so as to reduce the amount of contaminated groundwater impacting surface water in Ditches A and B and to decrease the amount of PFAS that ultimately migrates from the Site into the Bay of Green Bay. Extraction wells EX-10 to EX-14 were expected to be online in June 2025 and extraction well EX-15 later in 2025.

JCI/Tyco will document completion and performance of new extraction wells EX-10 to EX-15 in future reports. During the last reporting period, JCI/Tyco sampled groundwater at the five new extraction wells prior to their connection to the GETS. A preliminary review of these testing results indicates the following:

- In extraction wells EX-10 and EX-11, near Ditch A, the concentration of PFOA was around 100 ppt.
    - The PFOA concentrations are significantly less than groundwater captured in the other operating extraction wells for the GETS (~10,000 ppt). (*In JCI/Tyco's Oct. 3, 2024, letter, it states that the purpose of adding these two extraction wells is to capture groundwater in the upgradient portion of the plume migrating towards Ditch B so as to reduce the PFAS mass flux throughout the groundwater plume.)* Based on the initial testing results, it appears that these wells are not positioned to capture high concentrations of PFAS migrating towards Ditch B or meaningfully reduce mass flux in the groundwater plume.
    - The PFOA concentrations are less that those detected in monitoring well PZ-86-38, surface water coming into the Ditch A treatment system and at surface water monitoring point SW-26. (*In JCI/Tyco's Oct. 3, 2024, letter, it states that it expects that operation of these extraction wells will decrease the concentration of PFAS in local groundwater and surface water*.) Based on the initial testing results, it appears that these wells may not be positioned to achieve this outcome or meaningfully reduce the migration of PFAS to the southeast of the FTC.
- The concentration of PFOA in extraction well EX-12 was 45,000 ppt, which is the highest concentration detected to date in any GETS extraction well. The concentration of PFOA in extraction well EX-13 was 8,200 ppt, which is similar to the existing extraction wells in this area. These wells are screened from 20 to 35 feet below ground surface (bgs), which is approximately 10 feet deeper than their paired extraction wells EX-3 and EX-4. These new wells are located in areas that may reduce contaminant migration in groundwater toward monitoring well PZ-29-43 and may reduce concentrations and upwelling of contaminated groundwater into Ditch B and the tributary branch east of Pierce Avenue.
- The concentration of PFOA in extraction well EX-14 (formerly monitoring well PZ-64-67) was 3,700 ppt. It appears to be located to the flow path of the contaminant plume in the weathered bedrock that is migrating off the FTC property toward monitoring well PZ-29-68.

GETS Long-Term Monitoring and Reporting

On June 16, 2025, JCI/Tyco submitted a *Revised Interim Long-Term Monitoring Plan for Groundwater and Surface Water* (the "Revised LTM Plan"), which is a wholistic approach to monitoring the groundwater and surface water at the Site and includes long-term monitoring for the GETS. In the Revised LTM Plan, JCI/Tyco proposes to submit one annual monitoring report by March 31st of each year.

The DNR concurs with the wholistic monitoring approach with annual reporting on the surface water and groundwater monitoring results. The performance of the GETS relative to its effect on the groundwater and surface water concentrations and control of PFAS migration at the Site can be presented in the annual LTM Report. (The DNR's review of the Revised LTM Plan, including recommended additions for the GETS, is provided under separate cover.)

However, at this time, the DNR does *not* approve stopping the semi-annual *operations and maintenance* progress reports. The GETS is still being optimized to achieve its qualitative objectives and has not entered into a period of routine operations. Semi-annual *operations and maintenance* progress reports should continue during the period of optimization (Wis. Admin. Code § NR 724.13(3)). The elements to include in the semi-annual progress reports are summarized in **Attachment B.**

Next Steps

- Submit an addendum to the GETS Construction Documentation Report **within 60 days** after the new extraction wells are operational (Wis. Admin. Code § NR 724.15). Include revisions to applicable portions of the operations and maintenance plan, as needed (Wis. Admin. Code § NR 724.13(4)).
- Submit GETS Progress Report #6 by **Nov. 15, 2025;** include the data collected through Q3 2025 and an initial evaluation of operational effects of the new extraction wells and upgraded treatment system.
- Thereafter, submit semi-annual *operation and maintenance* progress reports for the GETS by **March 31st** and **Sept. 30th** of each year, or until otherwise approved by the DNR (Wis. Admin. Code § NR 724.13(3)).

As a reminder, this Site is subject to an enforcement action and therefore all submittals to the DNR under Wis. Admin. Code chs. NR 700-799 and submittals directed by the DNR must be accompanied by an Wis. Admin. Code ch. NR 749 fee per Wis. Stat. § 292.94. These fees are not pro-ratable or refundable per Wis. Admin. Code § NR 749.04(1). If you have any questions about whether to include a fee with a submittal, please contact DNR staff prior to submitting a document without a fee.

If you have any questions, please contact me at Alyssa.Sellwood@wisconsin.gov or (608) 622-8606.

Sincerely,

Alyssa Sellwood, PE
Water Resources Engineer
Remediation & Redevelopment Program

Attachments:

Attachment A: Summary of GETS Operations and Performance, Nov. 14, 2022, through May 11, 2025
Attachment B: Data to Include in GETS Semi-Annual Operation and Maintenance Progress Reports

cc: Jodie Thistle, DNR (via email: jodie.thistle@wisconsin.gov)

Attachment A

Summary of GETS Operations and Performance - Nov. 14, 2022, through May 11, 2025

GETS Operations:

- A total of 1,311,261 kilowatt hours (kWh) have been used to extract and treat approximately 281 million gallons of contaminated groundwater (Table 7).
- Approximately 48,000 pounds of ion exchange resin, 211,000 pounds of virgin granular activate carbon (GAC) and 529,000 pounds of regenerated GAC has been used to treat the extracted groundwater.
- Approximately 23 pounds of PFOA and 1.6 pounds of PFOS have been removed from the treated groundwater (Table 15). The mass of PFAS upgradient of the GETS should be estimated and used to evaluate GETS performance relative to this quantity (Wis. Admin. Code § NR 716.11(3)(d)).
- All treated groundwater was discharged to surface water in Ditch B where it crosses Pierce Avenue.
- The GETS removes PFOA and PFOS from the groundwater it treats (Table 8):
    - The average combined influent concentrations from all the extraction wells are approximately 10,000 ppt for PFOA and 700 ppt for PFOS.
    - All samples of the treated effluent had concentrations below the Wis. Admin. Code § NR 102.04 surface water standards for PFOA and PFOS.
- Currently, the combined rate of groundwater extraction of the GETS is approximately 260 gpm. The pumping rates vary between each extraction wells from approximately 16 to 43 gpm.
    - Extraction wells EX-1 and EX-2 were recently replaced with wells that can be treated more easily for biofouling; the pumping rates have improved and are more consistent in the new wells.
    - The pumping rate in extraction well EX-6 decreased over the last 6 months, likely from biofouling.
    - Extraction well EX-9 remains off, except for sampling, because it was found to be outside the desired capture area of the plume (Table 2).
- The concentration and mixture of PFAS varies in the groundwater captured by each extraction well:
    - PFOA is the dominant compound to the east; extraction wells EX-6, EX-7 and EX-8 generally capture the highest concentrations of PFOA (Table 6).
    - To the north, extraction well EX-1 captures the highest concentration of total PFAS; the dominant compound being 6:2 fluorotelomer sulfonate (FTS) (Figure A-2).

GETS Performance:

- The concentration of PFAS in the groundwater downgradient of the GETS extraction wells has increased in monitoring wells PZ-29-43 and PZ-29-68 (Figure 15 and Appendix C).
- The GETS has reduced, but does not prevent, the upwelling of contaminated groundwater into Ditch B (Tables 11 and 14).
    - The groundwater in streambed piezometers M04 to M09 contain PFOA greater than 1,000 ppt and groundwater upwelling into surface water was measured at each location in April 2025.
    - The surface water in tributary branch that joins Ditch B near Pierce Avenue has concentrations of PFOA that increase as water flows downstream from 13 ppt to 2,800 ppt.
- The concentrations of PFAS measured in the surface water in Ditch B downstream of the GETS capture zone have decreased; however, the concentrations still frequently exceed the Wis. Admin. Code § NR 102.04 surface water standards for PFOA and PFOS (Table 10 and Figure 11).
- Seasonal and regional changes and short-term precipitation events were the strongest influence water levels and stream flow in Ditch B (Figures 2 - 5).
- The concentrations of PFAS in the groundwater migrating from the FTC and captured by the GETS remain high and have not changed significantly since startup (Table 13 and Appendix A).

Attachment B

Data to Include in GETS Semi-Annual Operation and Maintenance Progress Reports

The data recommended for the Wis. Admin. Code § NR 724.13(3) semi-annual operation and maintenance progress reports for the GETS are summarized below. In general, these are data that describe the GETS operations and its direct and more immediate effects on conditions in Ditch B between surface water monitoring points U03 and M01 and piezometers PZ-5 and PZ-1D. (The reference to Tables, Figures and Appendices below are as numbered in GETS Progress Report #5.)

GETS Operations: **Tables 3, 4, 6-8 and 15, Figure 12 and Appendix A, and Section 4**

- Treatment Volumes, Run Time, Influent and Effluent Concentrations and Mass Removal
- Extraction Volumes, Pumping Rates and PFAS make-up and concentrations at each extraction well
- Sustainability Metrics (energy, carbon and ion exchange resin used)

Zone of Influence and Effects to Ditch B: **Tables 9-11 and 14, Figures 2-7 and 11**

- Stream Stage and Flow Rates relative to Season, Precipitation and GETS Discharge Rates
- PFAS concentrations and hydraulic gradients in streambed and surface water
- Monthly PFAS measurements for the influent at the Ditch B surface water treatment system

Notes:

- The data presented in Tables 2-9 may be limited the reporting period.
- Table 6 may be limited to the weeks when sampling occurred.