State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor
Karen Hyun, Ph.D., Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

May 13, 2025

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

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

SUBJECT: Semi-Annual Operation, Maintenance, and Optimization Progress Report #11
Ditch B Interim Action Treatment System (July 1 – Dec. 31, 2024)
JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI
BRRTS #02-38-580694

Dear Ms. Nelson:

On March 31, 2025, the Wisconsin Department of Natural Resources (DNR) received the *Semi-Annual Operation, Maintenance and Optimization Progress Report #11* (O&M Progress Report #11) for the interim remedial action to treat surface water in Ditch B at 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.

The DNR's review of O&M Progress Report #11 finds that the Ditch B system removed per- and polyfluoroalkyl substances (PFAS) and reduced the concentration of PFAS in the surface water it captured and treated. However, during times when the streamflow in the ditch is greater than the capacity of the system, some surface water goes untreated. The DNR recommends that JCI/Tyco continue to operate and report on the Ditch B system, and also evaluates if optimization or addition of other interim actions are needed to further reduce contaminant migration in Ditch B (Wis. Admin. Code § NR 708.11(1)(a)).

Background

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

A surface water drainage feature identified as Ditch B begins north of the FTC and flows east and then southeast and discharges into the Bay of Green Bay. In Oct. 2019, JCI/Tyco began an interim remedial action to treat surface water in Ditch B after testing confirmed it contained perfluorooctanoic acid (PFOA) up to 3,800 parts per trillion (ppt) and perfluorooctanesulfonic acid (PFOS) up to 190 ppt.

The Ditch B system located at 925 Pine Beach Road in Marinette, which is downstream from the FTC property and approximately 1,250 feet upstream from the Bay of Green Bay. The system captures surface water flowing in Ditch B and treats the captured water using suspended solids settling, bag filtration and granular activated carbon (GAC). The treated water is then discharged back to Ditch B under a Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit (WI-0046566-07-0) and the associated coverage letter, which specifies the effluent criteria and monitoring requirements.

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The Ditch B system has the capacity to treat up to approximately 700 gallons per minute (gpm); however, the streamflow in the ditch frequently exceeds this flow rate. During times when the streamflow exceeds the system's operating capacity, a portion of the surface water flowing in Ditch B goes untreated; these are frequent events.

NR 205 WPDES Permit

The effluent from the Ditch B treatment system is regulated under WPDES General Permit No. WI-0046566-07-0 and the associated coverage letter (updated Apr. 29, 2021). The DNR's Wastewater Program administers the WPDES permit and reviews the monthly electronic discharge monitoring reports submitted by JCI/Tyco. A review of the permit reporting is not included with this letter.

Summary and DNR Review of O&M Progress Report #11

JCI/Tyco's O&M Progress Report #11 covered the period from July 1 to Dec. 31, 2024. During this time, the system operated for 184 days and treated approximately 161 million gallons of surface water. However, JCI/Tyco calculated the total flow volume in the ditch during this time to be around 415 million gallons, which means that some 254 million gallons of surface water in Ditch B went untreated.

System Operation and Performance

The system reduced the PFAS concentrations in the surface water it captured and treated. Surface water captured by the system had concentrations up to 430 ppt for PFOA and up to 58 ppt for PFOS; the treated water exiting the system had concentrations less than 95 ppt for PFOA and less than 5.3 ppt for PFOS.

During the reporting period, the Ditch B system used approximately 242,000 pounds of GAC and 267,138 kilowatt-hours of electricity to remove 0.29 pounds of PFOA and 0.04 pounds of PFOS from 159 million gallons of captured surface water. Cumulatively, since startup of the system began in Oct. 2019, approximately 10.7 pounds of PFOA and 0.89 pounds of PFOS have been removed from approximately 1.4 billion gallons of captured surface water.

Routine system maintenance that occurred during this reporting period included removal of accumulated sediment, replacement of spent bag filters and replacement of spent GAC. The spent bag filters were collected in drums and disposed by End Point Solutions, and the spent GAC was reactivated by Tetrasolv Filtration, Inc. Documentation of the handling of these waste materials was included in Appendix E. Other maintenance during this reporting period included repair of a leaking pipe fitting; the system was shut down during this repair.

Surface Water Monitoring

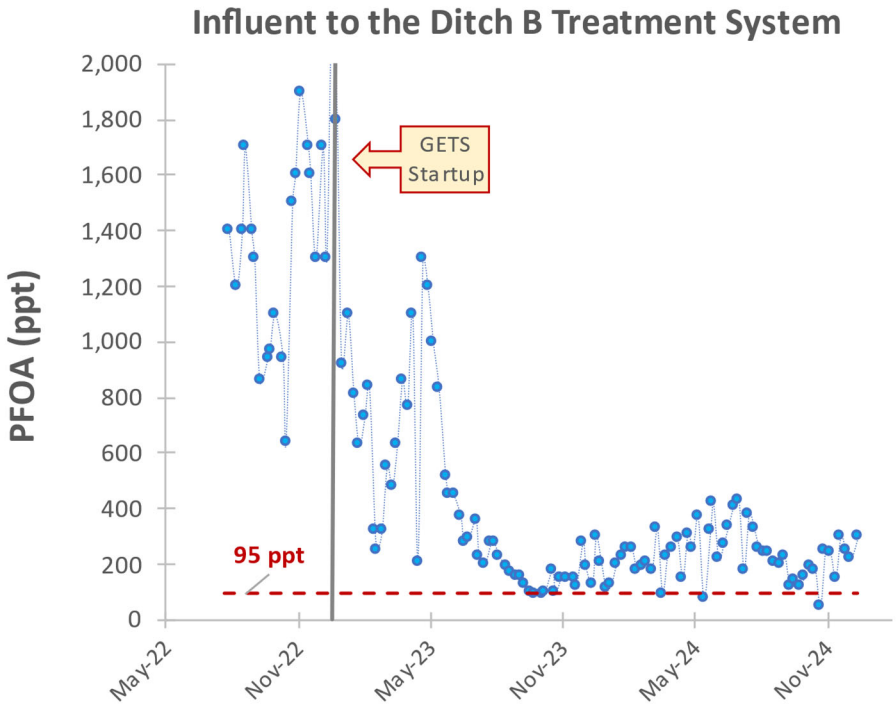
The system reduced the PFAS concentrations in the surface water samples measured downstream of treatment; however, for times when the surface water flow rate exceeds the treatment capacity of the system, the treated water can combine with uncaptured streamflow, resulting in higher concentrations of PFAS in the downstream surface water than in the treated effluent. The water in Ditch B sampled downstream of the treatment system, at surface water sampling points SW-39 and SW-L03, occasionally had levels of PFOA and PFOS that exceeded the Wis. Admin. Code § NR 102.04 surface water standards of 95 ppt for PFOA and 8 ppt for PFOS. During the reporting period, the downstream surface water concentrations were up to 110 ppt for PFOA and up to 14 ppt for PFOS.

Downstream surface water samples are collected once a month and may not always capture the mixing with untreated water that occurs during periods of high streamflow. As stated in its review of prior O&M Progress Reports, the DNR recommends that JCI/Tyco applies a mass balance approach and use the weekly measured streamflow and influent concentrations to estimate downstream concentrations in the Ditch B surface water.

Influence of GETS

Through its site investigation, JCI/Tyco determined that seepage of contaminated groundwater contributes to much of the PFAS contamination in the surface water flowing in Ditch B. Therefore, in Nov. 2022, JCI/Tyco began operating another interim remedial action – the groundwater extraction and treatment system (GETS) – with the goal of reducing the PFAS concentrations in Ditch B to the point with operation of the Ditch B treatment system is no longer needed.

The concentrations of PFOA and PFOS in the surface water captured by the Ditch B treatment system have declined since GETS operations began; however, the concentrations still exceed the Wis. Admin. Code § 102.04 surface water standards (see chart below). During this reporting period, samples of the surface water downstream of the GETS and captured by the Ditch B treatment system averaged 235 ppt for PFOA and 33 ppt for PFOS.



Currently, JCI/Tyco is constructing two new groundwater extraction wells near Ditch B to connect to the GETS to further control seepage of contaminated groundwater into the ditch. The influence that these new extraction wells have on PFAS concentrations in Ditch B will be evaluated in future reports. JCI/Tyco continues to state that its goal is to have the GETS replace the need for the Ditch B treatment system.

JCI/Tyco reports that the surface water in Ditch B is subject to a variety of other intermittent inputs (rainfall, snowmelt, stormwater discharge, surface runoff, etc.) and that during periods of high flow in the ditch, the PFAS detected in the surface water comes primarily from these other non-groundwater sources and not groundwater. Previously, it its review of O&M Progress Report #10, the DNR recommended that JCI/Tyco evaluates if other interim remedial actions are needed to address the “non-groundwater sources” of PFAS into Ditch B. Remedial actions to address these inputs have not been proposed at this time.

Next Steps

While the updates to the GETS are being implemented and evaluated, the DNR recommends that JCI/Tyco continues to operate the Ditch B treatment system and the submit semi-annual O&M Progress Reports in accordance with the approved operation, maintenance and monitoring plan (Wis. Admin. Code § NR 724.13(3)). Continued reporting on the pounds of GAC and electricity used per pound of PFOA and PFOS removed is recommended; these metrics can factor into future decisions for optimization and use of the Ditch B treatment system.

The DNR recommends that JCI/Tyco further characterize the other non-groundwater sources of PFAS to Ditch B as it evaluates the need to continue operation of the Ditch B treatment system and/or if other interim remedial actions are needed to target these other intermittent inputs of PFAS to the surface water in Ditch B.

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

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