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

Tony Evers, Governor

Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

October 3, 2024

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

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

SUBJECT: Response to the 2024 Site Investigation Status and Interim Long-Term Monitoring Report
JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI
BRRTS #02-38-580694

Dear Ms. Nelson:

On Aug. 23, 2024, the Wisconsin Department of Natural Resources (DNR) received the *2024 Site Investigation Status and Interim Long-Term Monitoring Report* ("2024 SI Status Report") 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.

The DNR reviewed the 2024 SI Status Report. The DNR agrees with JCI/Tyco's plan to continue implementing its current monitoring plans – plans that are designed to evaluate changes in contaminant concentration in surface water and groundwater due to natural processes and/or JCI/Tyco's interim actions. The DNR does not agree that the site investigation is complete; further work is needed to define the nature, degree and extent of contamination in all affected media and to select remedial actions for the Site (Wis. Admin. Code § NR 716.01). While the site investigation continues, the DNR recommends that JCI/Tyco revise the contaminant plume maps following the next comprehensive monitoring event planned for 2024 and that JCI/Tyco evaluate if optimization or addition of other interim actions are needed to further minimize contaminant migration (Wis. Admin. Code § NR 708.11(1)(a)).

Background

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

JCI/Tyco's site investigation activities completed through 2022 were documented in seven prior reports. These prior activities included sampling groundwater, surface water, stormwater, sediment and soil for PFAS and characterizing the Site for factors that control where and how the PFAS contamination migrates in the environment. Most recently, JCI/Tyco proposed additional field sampling of groundwater and surface water it its Aug. 24, 2023, *Additional Site Investigation Work Plan* and its Mar. 15, 2024, *Interim Long Term Monitoring Plan for Groundwater and Surface Water*. The DNR responded to these reports with recommendations for additional sampling locations. JCI/Tyco incorporated some, but not all of these suggestions into its field sampling plan. JCI/Tyco documented these updates and reasons some suggestions were not implemented in a June 3, 2024, response-to-comments letter.

2024 SI Status Report

The 2024 SI Status Report documents the groundwater and surface water sampling JCI/Tyco completed in 2023 through June 2024. This work included:

- Installation and sampling groundwater in seven vertical aquifer profile (VAP) borings.
- Installation of 15 monitoring wells.
- Collection of groundwater samples and water levels from 98 monitoring wells in June 2024[1].
- Collection of surface water samples from Ditches A, B, C, D and E in May 2023, July 2023 (except for Ditch E) and June 2024.
- Measurement of stream flow in Ditches A, B, C, D and E in May and July 2023.
- Collection of surface water samples from seven points in the Bay of Green Bay in June and Sept. 2023.

Five additional monitoring wells are proposed to be installed and sampled in fall 2024. These supplemental wells are described in Table 3-10.

JCI/Tyco's evaluation and interpretation of the PFAS contamination at the Site also included groundwater and surface water data from the monitoring of on-going interim actions and at its Stanton Street site (BRRTS No. 02-38-581955). Completed and on-going interim actions are descried in Section 2.4 and the current monitoring programs that apply to each sample location are summarized in Tables 2-1, 3-1 and 3-2 and Figure 3-1.

JCI/Tyco presents its current evaluation and interpretation of PFAS contamination in groundwater and surface water and the site conditions controlling and affecting contaminant migration in Sections 4, 5 and 6 in the report and the figures.

JCI/Tyco concludes that the site investigation activities to date have delineated the extent of the PFAS-contaminant plume and that monitoring should now focus on implementing its current monitoring plans – plans designed to evaluate changes in contaminant concentration in surface water and groundwater due to natural processes and/or JCI/Tyco's interim actions.

DNR Review

The DNR agrees with JCI/Tyco's recommendation to continue with its current monitoring plans. However, the DNR does not agree that the site investigation is complete; further work is needed to define the nature, degree and extent of contamination and to select remedial actions for the Site (Wis. Admin. Code § NR 716.01). Areas where the DNR recommends that JCI/Tyco complete additional technical evaluation or monitoring are discussed further below.

As JCI/Tyco continues work to complete the site investigation, JCI/Tyco should evaluate if and where additional interim actions, or modification to the current interim actions are needed to minimize contaminant migration (Wis. Admin. Code § NR 708.11(1)(a)). The advancement of interim actions at the Site could also include implementing continuing obligations (Wis. Stat. § 292.12(2)).

Nature, Degree and Extent of Contamination

The DNR agrees with much of the characterization of the surface water impacts and groundwater plume that has been completed to date near the outdoor testing area (OTA) and within the core of the plume to the east of the

[1] JCI/Tyco reported 100 wells sampled, but new monitoring wells PZ-80-37 and PZ-83-50 were not sampled in June 2024.

OTA towards Ditch B. However, additional work is needed to delineate on the nature, degree and extent of the contamination in all affected media at the Site.

Because the 2024 SI Status Report focused on groundwater and surface water, the technical review comments provided herein focus on these two media. The following is not an all-inclusive list that will guarantee that the contamination extent is delineated in these and other affected media, but rather is a response to data gaps or inconsistencies identified during the DNR's technical review of the 2024 SI Status Report.

- Include the groundwater-surface water interactions and the surface water concentrations measured in Ditches A, B, C, D, and E and other surface water monitoring points in the interpretation of the shallow contaminant plume (see **Attachment A**).
- Consider possible or measured preferential flow paths within the aquifer when interpreting the configuration of the contaminant plume between monitoring wells (see **Attachment A**).
- While Wis. Admin. Code ch. NR 141-compliant monitoring wells are used to meet the requirements of a site investigation, the results from previous VAP and private well sampling should not be ignored when interpreting the extent of contaminant plume in areas or depths where there is not data from a Wis. Admin. Code ch. NR 141-compliant monitoring well. (see **Attachment A**).
- The DNR has not agreed that the air dispersion pathway has been ruled out as a possible transport mechanism affecting contaminant distribution at the Site (as stated on page 32). On the contrary, in its Apr. 11, 2022, letter, the DNR stated that air dispersion should still be considered as a potential migration pathway when interpreting data collected during the site investigation.
- The DNR does not agree that there is "*no evidence of any PFAS compounds migrating west of the FTC*" (as stated on page 37). For example, the recent results from monitoring point VAP-87 indicate PFAS discharges from the FTC impacted groundwater near the southwestern property boundary. Additional lines of evidence are needed to support JCI/Tyco's conclusions about the extent of contamination to the west of the FTC. For example, monitoring wells west of the FTC could be installed and sampled for PFAS to see if the data supports other potential sources and/or a connection to discharges from the FTC.
- The DNR agrees that the extent of contamination in the weathered bedrock has been sufficiently delineated at this time. Additional evaluation and interpretation may be needed to understand the relative contribution of PFAS to bedrock from the FTC and the Stanton Street sites.

Interim Actions

To date, JCI/Tyco has completed a number of interim remedial actions at the Site; JCI/Tyco should continue to monitor and evaluate these interim actions. In addition, while the site investigation continues, the DNR recommends that JCI/Tyco evaluate if optimization or addition of other interim actions are needed to further minimize contaminant migration (Wis. Admin. Code § NR 708.11(1)(a)).

JCI/Tyco anticipates that its future monitoring will demonstrate a stable to receding groundwater plume; however, even a stable groundwater plume at this Site can contribute to the migration of a significant quantity of PFAS to the Menominee River, the Bay of Green Bay and other drinking water and surface water receptors. Current concentrations of PFAS measured in the Menominee River and the Bay of Green Bay are below current surface water standards; nonetheless, actions that minimize the mass of PFAS entering these water bodies is important to their long-term protection, especially given that PFAS are persistent in the environment. The highest concentration of PFOA detected in surface water samples JCI/Tyco collected from the Bay of Green Bay were 3 ppt; PFOS was also detected at 3 ppt. These concentrations are approaching the current maximum contaminant level (MCL) set by the U.S. EPA for public water supplies. Water from Green Bay is the source of drinking water to many communities including the city of Marinette.

Questions to help guide the next evaluation of interim actions could include, but are not limited to, the following:

- Is further remediation needed to address residual PFAS in soil and sediment (particularly in the northern branch of Ditch A)?
- What is the mass flux of PFAS from groundwater and surface water at discharge points to the Menominee River and Green Bay? Are there specific additional actions or modifications to current action that will minimize the mass flux at key locations.
- What is the residual PFAS mass in soil, groundwater and surface water on the FTC property? How does this compare to the quantity being captured by the current or planned interim actions?
- Are there locations where mass flux of PFAS off the FTC property is significant and is not controlled by current or planned interim actions?
- Are other private drinking water wells affected or likely affected by migration of contamination that should be provided an alternative source of drinking water?

Next Steps

JCI/Tyco should continue to implement its monitoring programs and reporting as planned. In addition, JCI/Tyco should use the results from its monitoring to determine if modification to, or new interim actions, are needed to control and further minimize the migration of PFAS.

- By Mar. 31, 2025, submit the results from the additional monitoring planned for 2024.
    - Include data from the five (and any other) new monitoring wells installed at the Site.
    - Submit updated cross-sections and plume maps that address the technical review comments provided herein.
    - Revise the color scheme of the contaminant plumes, so that groundwater having concentrations between approximately 100 and 5,000 does not look the same as the aquifer in the cross-section having concentrations less than 20 ppt. (Please use the same color scheme on the isoconcentration maps as the cross-sections).
    - Include any recommendations for where additional monitoring will be completed to support conclusions and make progress to complete the site investigation.
- By May 1, 2025, submit a report with information to evaluate interim actions based the current site characterization (Wis. Admin. Code § NR 716.11(3)(c).
    - Evaluate interim actions relative to the review comments and questions provided herein. Estimate mass and mass flux to help quantify the relative impact of each action.
    - Provide recommendations and a proposed schedule for next steps, which could include monitoring, modification of current interim actions and/or addition of new interim actions.
        - A design report may be required for any interim actions selected through this process (Wis. Admin. Code § NR 708.11(4)).
        - Continuing obligations may be imposed as part of the approval of the interim action(s) selected through this process (Wis. Stat. § 292.12(2)).

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

Attachment A: Supplemental Details to DNR's Review Comment for the Plume Delineation

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

Attachment A - Response to 2024 SI Status Report

Supplemental Details to DNR's Review Comment for the Plume Delineation

Groundwater-Surface Water Interactions

- On page 28, the text describes that Ditch A is primarily a losing stream along the segment between University Drive and south of Madsen Road. In June 2024, the concentration of PFOA+PFOS measured in Ditch A along University Drive was 420 ppt and 305 ppt near Madsen Road. However, the shallow contaminant plume of PFOA + PFOS greater than 100 ppt drawn on Figure 5-4 is not shown to be connected or influenced by PFAS entering groundwater along Ditch A. (In further support of this connection, the concentration of PFOA + PFOS measured previously in surface water samples collected from two ponds southeast of University Drive and Ditch A averaged about 250 ppt.)
- In June 2024, the concentration of PFOA+ PFOS measured in in Ditch C was 16 ppt and the shallow groundwater sample collected from monitoring well PZ-61-11, which is between Ditch C and Green Bay, was 17 ppt. These concentrations would indicate that the shallow groundwater with PFOA+PFOS greater that 20 ppt approaches and likely intersects portions of Ditch C (i.e., the groundwater plume extends farther than what is depicted on Figure 5-4).
- On page 44, the text describes how the plume to the southeast is "comprised of a region of generally dilute PFAS concentrations, with multiple fingers of higher concentrations along the dominant transport pathways migrating toward and discharging into Ditches D and E." This pattern is not depicted on Figure 5-4. (In June 2024, the concentration of perfluorooctanoic acid (PFOA) plus perfluorooctane sulfonate (PFOS) was 211 parts per trillion (ppt) in Ditch D and 37 ppt in Ditch E. However, the shallow contaminant plume of PFOA + PFOS drawn on Figure 5-4 is not connected to these ditches or their flow into Green Bay).
- Surface water concentrations in ponds and ditches are not included on the cross-sections, but these data are relevant to interpretation of the distribution of PFAS contamination at the Site.

Preferential Flow Paths:

- Same as above for comment related to description of flow paths presented on page 44.
- On page 37 it states that "overburden groundwater concentrations east and northeast of Ditch B are between 20 and 100 ng/L as most of the PFAS in overburden groundwater discharges to Ditch B." This is not entirely true; there have been some high and some low detections of PFAS east of Ditch B. Recently, in June 2024, the concentration of PFOA + PFOS detected in monitoring wells PZ-29-43 and PZ-79-25, which are east of Ditch B, were 4,300 and 1,000 ppt, respectively. These wells may align with preferential flow paths that dominate transport east and northeast from Ditch B.

Supplemental Data (when there is not a NR 141 monitoring well)

- In the area just south of Ditch E, the concentration of PFOA+PFOS measured in groundwater samples collected from two different VAPs has been greater that 20 ppt. The concentrations detected in these groundwater samples were similar to the concentrations detected in surface water in Ditch E and in the pond south of Ditch E (surface water monitoring point SW-38). However, a Wis. Admin. Code ch. NR 141-compliant monitoring well has not been installed at this location and the contaminant plume of PFOA+PFOS greater than 20 ppt drawn on Figures 5-4 and 5-5 is not shown to connect to this area.
- In area extending southeast from the losing segment of Ditch A, there are many private wells that were previously sampled, and is some instances the depth of the well is known. Many of the shallow wells in

this area had concentrations of PFOA+PFOS greater than 100 ppt. However, the shallow contaminant plume of PFOA + PFOS greater than 100 ppt drawn on Figure 5-4 is not shown to extend into this area.

- The PFAS sampling results are shown on the cross-sections for some, but not all, VAPs. The VAP sampling results may help with interpretation of the plume extent for locations where there is not data from a Wis. Admin. Code ch. NR 141-compliant monitoring well; however, the data should be used and presented consistently in that regard.