



June 8, 2022

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

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

SUBJECT: Response to Semi-Annual Operation, Maintenance, and Optimization Progress Report #6
Ditch A Interim Action Treatment System (July 1, 2021 – December 31, 2021)
JCI/Tyco FTC PFAS, 2700 Industrial Parkway South, Marinette, WI
BRRTS #02-38-580694

Dear Ms. Nelson:

On March 30, 2022, the Wisconsin Department of Natural Resources (DNR) received the *Semi-Annual Operation, Maintenance and Optimization Progress Report #6* (O&M Progress Report #6) for the Ditch A interim action 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 appropriate fee of \$425 required under Wisconsin Administrative Code (Wis. Admin. Code) § NR 749.04(1) for DNR review and response.

The DNR reviewed JCI/Tyco's O&M Progress Report #6 and concurs that the report met applicable regulatory requirements and that the operation and maintenance of the Ditch A interim action was effective at reducing the concentration of perfluorooctanoic acid (PFOA) perfluorooctanesulfonic acid (PFOS) in the surface water to concentrations that are below proposed surface water criteria of 95 and 20 parts per trillion (ppt), respectively.

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. The discharge occurred as the result of training, testing, research and development of PFAS-containing aqueous film forming foams (AFFF) at the Site starting in the early 1960s.

A surface water drainage feature identified as Ditch A flows south through the FTC property, continues south to the Little River and eventually discharges to the Bay of Green Bay in Lake Michigan. Elevated PFAS concentrations were detected in the surface water of Ditch A on the FTC property - PFOS up to 1,100 ppt and PFOA up to 6,000 ppt. In January 2019, JCI/Tyco began an interim action to reduce the concentration of PFAS in the surface water in this ditch.

The interim action includes a treatment system constructed adjacent to Ditch A on the southern boundary of the FTC property. The system captures surface water flowing in Ditch A at a check dam, 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 A downstream of the check dam 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.

Operation of the Ditch A treatment system reduces the amount of PFAS that migrates downstream in the ditch. The system is designed to treat a maximum flow rate of 100 gallons per minute (gpm). The surface water in the ditch occasionally freezes, runs dry or flows at a rate lower than 100 gpm, such that the system captures and treats most of the surface water migrating south in the ditch. There may be occasional high flow events or system downtime where surface water overtops the check dam and is not captured by the Ditch A system, and therefore goes untreated as it migrates downstream.

NR 205 WPDES Permit

The effluent from the Ditch A treatment system is regulated under WPDES General Permit No. WI-0046566-07-0 and the associated coverage letter (updated June 4, 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 of O&M Progress Report #6

Operation and Maintenance

JCI/Tyco's O&M Progress Report #6 covered the period from July 1 to December 31, 2021. Flow in Ditch A is intermittent, such that the system only needed to be on for 61 days, primarily in July and August 2021. During this time, the system treated over 7.92 million gallons of surface water and operated for 97 percent of the time; the 3 percent system downtime was for planned maintenance activities. No overtopping of the check dam was reported during this period and all the streamflow in Ditch A was reported to be captured and treated by the system.

Between December 20 and 22, 2022, the Ditch A system was also used to treat 46,720 gallons of water generated during construction of the Groundwater Extraction and Treatment System (GETS). The water was transported from the GETS construction site, run through the treatment system and then discharged into Ditch A. There was no stream flow reported in Ditch A during December 2022, such that treatment of the construction water did not prevent or limit treatment of surface water in Ditch A.

Routine system maintenance during this 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 shipped to a Cabot Corporation facility in Pryor, Oklahoma to be reactivate and reused in the treatment system. Documentation of the handling of these waste materials was included in Appendix E of O&M Progress Report #6. The sediment was stored in drums in the Ditch A treatment building for future disposal.

During this period, approximately 0.04 pounds of PFOA and 0.02 pounds of PFOS were removed from Ditch A. Cumulatively, since initial startup in January 2019, the system has removed approximately 0.72 pounds of PFOA and 0.39 pounds of PFOS from the surface water. These mass estimates were calculated by JCI/Tyco based on the weekly volume treated by the system and the weekly PFAS concentrations measured in the system influent and effluent.

Long-Term Monitoring

Historical monitoring of the upstream (pre-treatment) surface water in Ditch A have shown that concentrations of PFOA and PFOS fluctuate; the concentrations recorded during this period were between 8.8 and 2,100 ppt for PFOA and 8.2 and 1,000 ppt for PFOS. The measured concentrations are within the ranges previously detected in Ditch A. (Note, the concentrations of PFOA and PFOS detected in GETS construction water that was run through the system for 2 days in December were 12,000 and 200 ppt, respectively).

JCI/Tyco measured the concentration of PFOA and PFOS weekly in the treated effluent; the concentrations recorded during this period were < 0.74 to 2.9 ppt for PFOA and < 0.57 ppt for PFOS. The treatment system, on average, removed 98.7 percent of the PFOA and 100 percent of the PFOS from the water that it treated. The treated effluent was below the proposed surface water criteria of 95 ppt for PFOA and 8 ppt for PFOS.

JCI/Tyco collected two monthly surface water samples immediately downstream of the treatment system (SW-40); the surface water concentrations were < 0.82 ppt for PFOA and < 0.99 ppt for PFOS. The surface water concentrations in Ditch A immediately downstream of the treatment system were below the proposed surface water criteria.

JCI/Tyco's Operation, Monitoring and Maintenance Plan (OM&M Plan) for the Ditch A interim action included a method to estimate the total stream flow in Ditch A and the amount of PFOA and PFOS migrating downstream from the treatment system in the ditch.

On July 1, 2021, JCI/Tyco began reporting the estimated total weekly stream flow in Ditch A. JCI/Tyco reported that all the streamflow in Ditch A was able to be captured and treated by the system. Based on the removal efficiency reported for the system, negligible PFOS and less than 10.2 mg (0.000022 pounds) of PFOA were reported to migrate in surface water from the FTC property in Ditch A during this reporting period.

DNR Review of O&M Progress Report #6

JCI/Tyco's O&M Progress Report #6 was prepared in accordance with the approved OM&M Plan and included sufficient information to evaluate the effectiveness of the interim remedial action in achieving the environmental and public health laws (Wis. Admin. Code § NR 724.17(4)(a)). Management of waste materials generated during water treatment and metrics to evaluate PFAS concentrations in surface water in Ditch A immediately downstream of the treatment system were included for the first time in this Progress Report.

The Ditch A treatment system, as currently maintained, is effective at removing PFOA and PFOS from the water it treats. Because the system was reported to treat all the streamflow in Ditch A on the FTC property, the PFOA and PFOS concentrations measured in the system effluent are expected to be representative of the surface water concentrations in Ditch A immediately downstream of the treatment system; this was supported by the results of two downstream surface water samples collected in the ditch at SW-40 during this reporting period. Based on the information provided in Progress Report #6, the DNR concurs that the current operation and maintenance of the Ditch A treatment system is effective at reducing the surface water concentrations of PFOA and PFOS to below the proposed surface water criteria in Ditch A at the point where the ditch leaves the FTC property.

Next Steps

DNR recommends that JCI/Tyco continue to document operation, maintenance and effectiveness of the Ditch A treatment system in semi-annual O&M Progress Reports (Wis. Admin. Code § NR 724.13(3) and Wis. Admin. Code § NR 724.17(4)(a)). Because the information included in O&M Progress Report #6 met applicable regulatory requirements, no changes are recommended for the next semi-annual report.

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 about this letter, please contact me, the DNR Project Manager, at (608) 622-8606 or Alyssa.Sellwood@wisconsin.gov.

Sincerely,

A handwritten signature in black ink that reads "Alyssa Sellwood". The signature is written in a cursive style with a large, looped initial 'A'.

Alyssa Sellwood, PE
Complex Sites Project Manager
Remediation & Redevelopment Program

cc: Ben Verburg, Arcadis (via email: ben.verburg@arcadis.com)
Jodie Peotter, DNR (via email: Jodie.Peotter@wisconsin.gov)