

Permit Fact Sheet

General Information

Permit Number:	WI-0021440-09	
Permittee Name:	Village of Fairwater	
Mailing Address:	Village of Fairwater, PO Box 15	
City/State/Zip:	Fairwater, WI 53931	
Discharge Location:	Located south of Highway 44 just west of the village of Fairwater and just south of the Railroad tracks.	
Designated Use:	Tributary to the Grand River, in the “Upper Grand River Watershed” (UF 12) in the Upper Fox River Basin, recreation.	
StreamFlow (Q _{7,10}):	For the tributary, using a value of 0 cfd for the 7-Q ₁₀ . The USGS has estimated that the annual 7-Q ₁₀ for the Grand River is 0.37 cfs, and that the annual 7-Q ₂ is 1.0 cfs. The USGS also calculated seasonal flow values and those are listed in the 1/13/2009, WQBEL memo.	
Stream Classification:	Limited Aquatic Life Fishery (Intermediate Variance Category, NR 104). The Grand River is a Warm Water Sport Fishery.	
Design Flow(s)	Annual Average	0.051 MGD
Significant Industrial Loading?	A local vegetable processing facility named Bonduelle discharges some wastewater from June through November, which increases the hydraulic loading. This treatment system was designed to handle this seasonal wastewater load.	
Operator at Proper Grade?	Yes, the facility is rated as an Advanced level facility in subclasses A3, Recirculating Media Filters. The Operator-In-Charge, Keith Schwandt has this Advanced level certification as well as A4, for Ponds, Lagoons, or Natural.	
Pretreatment Program Approval:	N/A – Facility flows are less than 5 MGD.	

Facility Description

The Village of Fairwater, in western Fond du Lac County, owns and operates a two-stage, recirculating sand filter wastewater treatment facility. This facility was designed for an average annual flow of 0.051 MGD (51,000 gallons per day) and constructed in 2004 on the site of an older WWTF that consisted of a 2-cell stabilization pond which has been properly abandoned, although the ponds remain for wildlife value. Treated effluent is discharged to a tributary to the Grand River via Outfall 004, located in the “Upper Grand River Watershed” (UF 12) in the Upper Fox River Basin. Solid residuals are stored in septic tanks and septage is not anticipated to be removed during this permit term.

Sample Point Designation

Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
704		Influent - Representative samples collected from the automatic sampling device drawing samples prior to the septic tank.
004	7/1/2017 to 11/30/2021 = 0.036 MGD	Effluent - Representative samples of the effluent from the recirculating sand filter treatment system shall be collected from the effluent channel.
990		Settleable solids and floating scum that accumulate in the septic tanks preceding the recirculating sand filter. Septic tanks are serviced by a licensed septage business on an as-needed basis.

1 Influent – Monitoring Requirements

Sample Point Number: 704- Influent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	2/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit:

No changes.

2 Surface Water - Monitoring and Limitations

Sample Point Number: 004- Effluent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	Applies September - May each year.
BOD5, Total	Weekly Avg	23 mg/L	2/Week	24-Hr Flow Prop Comp	Applies June - August each year.
BOD5, Total	Monthly Avg	20 mg/L	2/Week	24-Hr Flow	Applies year round.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
				Prop Comp	
BOD5, Total	Weekly Avg	19 lbs/day	Weekly	Calculated	Applies year-round.
Suspended Solids, Total	Weekly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	Applies September - May each year.
Suspended Solids, Total	Weekly Avg	23 mg/L	Weekly	24-Hr Flow Prop Comp	Applies June - August each year.
Suspended Solids, Total	Monthly Avg	20 mg/L	Weekly	24-Hr Flow Prop Comp	Applies year-round.
Suspended Solids, Total	Weekly Avg	16 lbs/day	Weekly	Calculated	Applies year-round.
Suspended Solids, Total	Monthly Avg	9.5 lbs/day	Monthly	Calculated	Applies year-round.
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly discharge of TSS and report on the last day of the month on the DMR. See Standard Requirements section 4.4.2 for the appropriate formula.
Suspended Solids, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of TSS discharged and report on the last day of the month on the DMR. See Standard Requirements section 4.4.2 for the appropriate formula.
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	5/Week	Grab	Applies September - May each year.
Dissolved Oxygen	Daily Min	6.0 mg/L	5/Week	Grab	Applies June - August each year.
Nitrogen, Ammonia (NH3-N) Total	Daily Max	13 mg/L	Weekly	24-Hr Flow Prop Comp	Applies year round.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	13 mg/L	Weekly	24-Hr Flow Prop Comp	Applies year round.
Nitrogen, Ammonia	Monthly Avg	9.6 mg/L	Weekly	24-Hr Flow	Applies July - September

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
(NH3-N) Total				Prop Comp	each year.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	13 mg/L	Weekly	24-Hr Flow Prop Comp	Applies October – March each year.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	11 mg/L	Weekly	24-Hr Flow Prop Comp	Applies April - June each year.
Phosphorus, Total	Monthly Avg	6.0 mg/L	Weekly	24-Hr Flow Prop Comp	This is an MDV interim limit effective through 06/30/2027. See the MDV/Phosphorus sections and phosphorus schedules
Phosphorus, Total	Monthly Avg	1.0 mg/L	Weekly	24-Hr Flow Prop Comp	This is an interim MDV limit effective on July 1, 2027. See the MDV/Phosphorus sections and phosphorus schedules.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the total monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See Standard Requirements section 4.4.2 for 'Appropriate Formulas' to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the total monthly discharges (for the months that the MDV is in effect) for the calendar year on the Annual report form.
Chloride	Weekly Avg	400 mg/L	4/Month	24-Hr Flow Prop Comp	
Chloride	Monthly Avg	400 mg/L	4/Month	24-Hr Flow Prop Comp	
Chloride, Variable Limit		lbs/day	4/Month	Calculated	Look up the chloride mass from the 'Variable Chloride Mass' table and report the variable limit in the Chloride Variable Limit column on the eDMR.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Monitoring Section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring Section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Monitoring Series section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	"See section for WET testing requirements and schedule.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	"See section for WET testing requirements and schedule.
Temperature		deg F	Daily	Continuous	Monitoring only for one year (2027).

Changes from Previous Permit

TSS: Addition of year-round limits (Weekly Average – 16 lbs/day, Mnthly Average 9.5 lbs/day)

Ammonia Nitrogen: Limits for Daily Maximum and Weekly average reduced to 13 mg/L year-round. Monthly average limits reduced to 13 mg/L for the months of January – March and October – December.

pH & Dissolved Oxygen: Increase of testing from 3/Week to 5/Week.

Phosphorus MDV: The permittee has applied for a multi-discharger variance (MDV) for phosphorus for this permit term and the application has been approved by the Department. An MDV interim limit of 6.0 mg/L has been added that goes into effect per a compliance schedule. The permittee is now required to report the total amount of phosphorus discharged in lbs/month and lbs/year. By March 1 of each year the permittee shall make a payment(s) to participating county(s) of \$67.45 per pound of phosphorus discharged during the previous year in excess of the target value of 0.2 mg/L.

Chloride: Weekly average limit reduced to 400 mg/L and the addition of monthly average limit of 400 mg/L. Also, the addition of a weekly average limit of 170 lbs/day and a wet weather mass limit of 434 lbs/day.

Addition of Nitrogen Monitoring Series

Addition of Temperature monitoring.

Explanation of Limits and Monitoring Requirements

Flow Rate, BOD pH & Dissolved Oxygen – All were reviewed and analyzed but it was determined that no changes from previous permit are necessary.

Total Suspended Solids (TSS) – TSS effluent limits in lbs/day are calculated as recommended in the TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (April 2020). This WLA found in Appendix I of the Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf Basins (UFW TMDL) report dated February 2020 are expressed as maximum annual loads (lbs/year). The annual WLA for Fairwater is 1,864 lbs/year.

Weekly average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to concentrations of 37 mg/L and 22 mg/L at the facility design (maximum annual average for industries) flow of 0.051 MGD. Fairwater can currently meet the TSS mass limits of 16 lbs/day as a weekly average and 9.5 lbs/day as a monthly average based on mass data from their current permit term. Therefore, the TMDL mass limits are recommended to be effective immediately upon permit reissuance.

Phosphorus – The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Upper Fox and Wolf River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA in February 2020.

With the permit application, Fairwater has applied for the phosphorus multi-discharger variance (MDV). Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. A review of effluent phosphorus data indicates that Fairwater will be unable to comply with the 0.8 mg/L phosphorus limits required under s. 283.16 (6) (a) 1., Wis. Stats. Therefore, the recommended interim limit, pursuant to s. 283.16 (6) (am), Wis. Stats., is 1.0 mg/L as a monthly average. A compliance schedule may be appropriate to meet this interim limit but compliance with 1.0 mg/L shall be no later than the end of the reissued permit.

The effluent data indicates that 4-day P₉₉ value of **6.0 mg/L is a level currently achievable (LCA)** for the discharge. A limit of 6.0 mg/L as a monthly average should not be exceeded during the compliance schedule.

Phosphorus MDV (Multi-Discharger Variance) Requirements

Optimization: The permittee shall continue to optimize performance to control phosphorus discharges in accordance with s. 283.16(6), Wis. Stats. See the Schedules section for optimization requirements.

Watershed Provisions: The permittee is required to implement watershed measures to reduce the amount of phosphorus entering the receiving water. The permittee has selected the following approved watershed measure.

Payment to County for Phosphorus Reduction: The permittee shall make payments for phosphorus reduction to the county or counties approved by the Department per s. 283.16(8), Wis. Stats. The permittee shall make a total payment by March 1 of each year in the amount equal to the per pound amount of \$64.75 times the number of pounds by which the effluent phosphorus discharged during the previous year exceeded the permittee's target value or \$640,000, whichever is less. The target value is 0.2 mg/L per s. 283.16(1)(h), Wis. Stats., and is applicable during the months that the MDV is in effect. The MDV is in effect year-round. Refer to the Schedules section for the scheduled annual requirements.

Annual Payment Calculation: The annual payment is equal to the phosphorus load that exceeds the target value multiplied by \$64.75 per pound. Use the steps shown below to calculate the annual payment. In addition, the Department shall send a statement to the permittee specifying total payment due to the participating counties each year in accordance with the Schedules section.

Ammonia Nitrogen – No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code. Water quality-based effluent limitations are evaluated for Ammonia Nitrogen based upon water quality criteria in ch. NR 105 (as revised in March 2004), including acute toxicity criteria (ATC) and chronic toxicity criteria (CTC). Effluent limitations for ammonia are calculated using the procedures in s. NR 106.32, Wis. Adm. Code and are shown in the WQBEL dated March 31, 2023.

Chloride – Considering available effluent data from the current permit term (12/04/2017 – 01/19/2023), the 1-day P99 chloride concentration is 636 mg/L, and the 4-day P99 of effluent data is 461 mg/L. Because the 4-day P99 exceeds the calculated weekly average WQBEL, an effluent limit is needed in accordance with s. NR 106.05(4)(b), Wis. Adm. Code. Fairwater currently has a chloride variance, but they have not reapplied for a variance and are therefore subject to the calculated WQBEL.

Because Fairwater is subject to the WQBEL of 400 mg/L, a weekly average mass limit of 170 lbs/day (400 mg/L x 0.051 MGD x 8.34) is required based on the annual average design flow. A wet weather mass limit of 434 lbs/day (400 mg/L x 0.13 MGD x 8.34) is also required based on the peak weekly design flow.

Because a weekly average chloride limit of 400 mg/L is needed, a monthly average limit equal to the weekly average limit is required. Therefore, it is recommended that the reissued permit also include a monthly average limit of 400 mg/L.

Total Nitrogen Monitoring (NO₂+NO₃, TKN and Total N) - The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the “Guidance for Total Nitrogen Monitoring in Wastewater Permits” dated October 1, 2019.

Acute & Chronic WET Testing - After consideration of the guidance provided in the Department's WET Program Guidance Document (2019) and other information described above, 3x/permit term acute WET tests and 1x yearly chronic WET tests are recommended in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued)

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA in the effluent as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

Expression of Limits – In accordance with the federal regulation 40 CFR 122.45(d), limits in this permit are to be expressed as weekly average and monthly average limits whenever practicable. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of E. coli bacteria samples collected in any calendar month may exceed 410 count/100 mL.

Monitoring Frequency Evaluation - Monitoring frequencies for parameters that have final effluent limits in effect during this permit term were evaluated taking into consideration the size and type of the facility, and whether the monitoring occurs frequently enough to characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Monitoring frequency decisions are based on requirements in s. NR 205.066(1), Wis. Adm. Code, (decisions are case-by-case) and considering the factors in s. NR 210.04 (a) through (e), Wis. Adm. Code, along with recommendations provided in the Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021).

Since data submitted during the previous permit term shows consistent compliance with permit limitations for most parameters, and the set monitoring frequency is consistent with requirements of state code, the current monitoring frequency is continued in the proposed permit, except for pH and Dissolved Oxygen. Consideration for increasing sample frequency for process control parameters (pH & Dissolved Oxygen) is that they are tested for in-house, can quickly provide information on how well a treatment system is performing and help identify potential compliance issues. The increased monitoring frequency also ensures better calibration of sampling equipment, improves data reliability, and ensures more frequent operator oversight of the treatment plant.

3 Septage Management - Monitoring and Limitations

Septage management is required in accordance ch. NR 113, Wisconsin Administrative Code. Records must be kept and made available to the Department on request. Required record keeping includes volumes of septage pumped, dates when the septage was removed, land application site DNR number and method used to satisfy pathogen and vector control, and/or the treatment plant where septage is disposed. Annual reporting is required when the permittee land applies the septage. Annual reporting is also required when the permittee disposes of septage at a designated treatment facility.

Sample Point Number: 990- Septage

Changes from Previous Permit:

No changes.

Explanation of Limits and Monitoring Requirements

Requirements for septage management are determined in accordance with ch. NR 113, Wis. Adm. Code.

4 Schedules

4.1 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
<p>Land Application Management Plan Submittal: Submit an updated management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.</p> <p>Updated plan shall be submitted 60 days prior to planned land application of municipal sludge.</p>	

4.2 Phosphorus Multi-Discharger Variance Interim Limit (1.0 mg/L)

The permittee shall comply with the 1.0 mg/L MDV interim effluent limit by the end of this compliance schedule.

Required Action	Due Date
<p>Submit Plans & Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Wis. Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with the interim phosphorus effluent limit and a schedule for completing construction of the upgrades by the 'Complete Construction' date specified below.</p>	12/31/2024
<p>Treatment Plant Upgrade: Upon approval of the final construction plans and schedule by the</p>	06/30/2025

Department and pursuant to s. 281.41, Wis. Stats., the permittee shall initiate construction of the treatment plant upgrades in accordance with the approved plans and specifications.	
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	06/30/2026
Complete Construction and Achieve Compliance: The permittee shall complete construction and achieve compliance with the phosphorus interim effluent limit of 1.0 mg/L.	07/01/2027

4.2 Phosphorus Schedule - Optimization Plan

The permittee is required to optimize performance to control phosphorus discharges per the following schedule.

Required Action	Due Date
Optimization Plan: The permittee shall prepare an Optimization Plan and submit it for Department approval. The plan shall include an evaluation of collected effluent data, possible source reduction measures and operational improvements to optimize performance to control phosphorus discharges. The plan shall contain a schedule for implementation of the measures and improvements. Once the plan is approved by the Department, the permittee shall take the steps called for in the Optimization Plan and follow the schedule of implementation as approved.	06/30/2025
Progress Report #1: Submit a progress report on optimizing removal of phosphorus.	06/30/2026
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	06/30/2027
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	06/30/2028
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	06/30/2029

4.3 Phosphorus Payment per Pound to County

The permittee is required to make annual payments for phosphorus reductions to the participating county or counties in accordance with s. 283.16(8), Wis. Stats, and the following schedule. The price per pound will be set at the time of permit reissuance and will apply for the duration of the permit.

Required Action	Due Date
<p>Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of each calendar year. The amount due is equal to the following: [(lbs of phosphorus discharged minus the permittee's target value) times (\$[ENTER PRICE PER POUND] per pound)] or \$640,000, whichever is less. See the payment calculation steps in the Surface Water section.</p> <p>The permittee shall submit Form 3200-151 to the Department by March 1 of each calendar year indicating total amount remitted to the participating counties to verify that the correct payment was made. The first payment verification form is due by the specified Due Date.</p> <p>Note: The applicable Target Value is [CHOOSE ONE: the TMDL derived limit value OR 0.2 mg/L] as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is \$50.00 adjusted for CPI.</p>	03/01/2025
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2026
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total	03/01/2027

amount remitted to the participating counties.	
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2028
Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2029
Continued Coverage: If the permittee intends to seek a renewed variance, an application for the MDV (Multi Discharger Variance) shall be submitted as part of the application for permit reissuance in accordance with s. 283.16(4)(b), Wis. Stats.	
Annual Verification of Payment After Permit Expiration: In the event that this permit is not reissued prior to the expiration date, the permittee shall continue to submit Form 3200-151 to the Department indicating total amount remitted to the participating counties by March 1 each year.	

Explanation of Schedules

As stated above, NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. S. NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge.

If the Department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

Phosphorus:

Optimization - Per s. 283.16(6)(a), Wis. Stats. the Department may include a requirement that the permittee optimize the performance of a point source in controlling phosphorus discharges, which may be necessary to achieve compliance with multi-discharger variance interim limits. This compliance schedule requires the permittee to prepare an optimization plan with a schedule for implementation and submit it for Department approval. The permittee shall take the steps called for in the optimization plan and submit annual progress reports on optimizing the removal of phosphorus.

Continued Optimization - Per s. 283.16(6)(a), Wis. Stats. the Department may include a requirement that the permittee optimize the performance of a point source in controlling phosphorus discharges, which may be necessary to achieve compliance with multi-discharger variance interim limits. This compliance schedule requires the permittee to continue to implement the optimization plan that was approved during the previous permit term.

Interim Limit - Subsection 283.16(6), Wis. Stats., establishes required interim phosphorus effluent limits that must be met for multi-discharger variance (MDV) eligibility. The schedule above provides the permittee with two years to comply with that limit.

1.0 mg/L Interim Limit - Subsection 283.16(6), Wis. Stats., establishes required interim phosphorus effluent limits that must be met for multi-discharger variance (MDV) eligibility. Subsection 283.16(6)(am), Wis. Stats., allows a technology based phosphorus limit of 1.0 mg/L as the MDV interim limit if a permittee certifies that its treatment facility cannot achieve compliance with the MDV interim limit without a major facility upgrade. The permittee qualifies for a 1.0 mg/L total phosphorus MDV interim limit and the schedule above provides the permittee with four years to comply with that limit.

County Payment - Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce non-point sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the “Payment to Counties”

watershed option described in s. 283.16(8), Wis. Stats. Under this option the permittee shall make annual payment(s) to participating county(s) that are calculated based on the amount of phosphorus actually discharged during a calendar year in pounds per year less the amount of phosphorus that would have been discharged had the permittee discharged phosphorus at a target value concentration of 0.2 mg/L. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal \$64.75 per pound. This schedule requires the permittee to submit Form 3200-151 to the Department indicating the total amount remitted to the participating county(s).

PUBLIC NOTICE

Phosphorus Multi-Discharger Variance: The Department has determined that the permittee is eligible for a phosphorus multi-discharger variance (MDV) in accordance with s. 283.16, Wis. Stats. The MDV provides a time extension for the permittee to comply with the final water quality based effluent limits for phosphorus while contributing funds towards nonpoint pollution control projects to reduce phosphorus. Comments on this determination are requested and additional supporting documentation and data are available upon request.

Attachments:

March 31, 2023 Water Quality-Based Effluent Limitations for Fairwater Wastewater Treatment Facility WPDES Permit No. WI-0021440-09

July 24, 2023 Letter - Conditional approval of a multi-discharger phosphorus variance

Expiration Date:

June 30, 2029

Justification Of Any Waivers From Permit Application Requirements

No waivers from permit application requirements granted.

Prepared By: Sarah Adkins Wastewater Specialist

Date: May 23, 2024

CORRESPONDENCE/MEMORANDUM

DATE: 03/31/2023

TO: Sarah Adkins – NER

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Fairwater Wastewater Treatment Facility
WPDES Permit No. WI-0021440-09

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from Fairwater Wastewater Treatment Facility in Fond du Lac County. This municipal wastewater treatment facility (WWTF) discharges to the unnamed tributary located in the Upper Grand River Watershed in the Upper Fox River Basin. This discharge is included in the Upper Fox and Wolf River Basin TMDL as approved by EPA in February 2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 004:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD ₅ Sept – May June – Aug			30 mg/L 23 mg/L 19 lbs/day	20 mg/L 20 mg/L		1
TSS Sept – May June – Aug Year-round			30 mg/L 23 mg/L 16 lbs/day	20 mg/L 20 mg/L 9.5 lbs/day		3
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen Sept – May June – Aug		4.0 mg/L 6.0 mg/L				1
Ammonia Nitrogen March April May – June July – Sept October November December January – February	13 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L		13 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L	13 mg/L 11 mg/L 11 mg/L 9.6 mg/L 13 mg/L 13 mg/L 13 mg/L 13 mg/L		4,5
Phosphorus LCA HAC Final – TMDL				6.0 mg/L 1.0 mg/L 0.27 lbs/day	0.088 lbs/day	3,6
Chloride			400 mg/L 170 lbs/day	400 mg/L		4,7

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
TKN, Nitrate+Nitrite, and Total Nitrogen						8
WET						9,10
Temperature						11

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Upper Fox and Wolf River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA in February 2020.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. If Fairwater decides to have variable daily maximum ammonia limits rather than the single 13 mg/L, the following limits are recommended:

Year-round daily maximum

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	83	7.0 < pH ≤ 7.1	51	8.0 < pH ≤ 8.1	11
6.1 < pH ≤ 6.2	82	7.1 < pH ≤ 7.2	46	8.1 < pH ≤ 8.2	8.8
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	40	8.2 < pH ≤ 8.3	7.3
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	35	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	4.9
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	26	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	22	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.8
6.8 < pH ≤ 6.9	60	7.8 < pH ≤ 7.9	16	8.8 < pH ≤ 8.9	2.4
6.9 < pH ≤ 7.0	56	7.9 < pH ≤ 8.0	13	8.9 < pH ≤ 9.0	2.0

	Weekly Average mg/L	Monthly Average mg/L
March	40	33
April	19	11
May – June	28	11
July – September	24	9.6
October	29	16
November	28	16
December	31	16
January – February	31	25

6. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 6.0 mg/L should be effective upon permit reissuance. A compliance schedule may be included in the permit until the highest attainable condition (HAC) limit of 1.0 mg/L can be met. The final WQBELs are the TMDL – based mass limits.
7. A wet weather mass limit of 434 lbs/day is also required.

8. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total kjeldahl nitrogen (TKN) (all expressed as N).
9. 3/permit term acute WET testing and 1x yearly chronic WET testing is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 46%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5% and the dilution water used in WET tests conducted on Outfall 004 shall be a grab sample collected from the Grand River upstream from the confluence of the tributary.
10. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).
11. Monitoring only for one year.

If Fairwater submits an approvable SOP for the rare earth additive, no acute WET testing and 2/permit term chronic WET testing would be recommended.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, 2016 Ammonia Calculations & Map

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Attachment #1
**Water Quality-Based Effluent Limitations for
 Fairwater Wastewater Treatment Facility**

WPDES Permit No. WI-0021440-09

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Fairwater, in western Fond du Lac County, owns and operates a two-stage, recirculating sand filter wastewater treatment facility. This facility was designed for an average annual flow of 0.051 MGD.

Disinfection of the effluent is not required based on the conditions of s. NR 210.06(3), Wis. Adm. Code. It should be noted that recreational use surveys may be re-evaluated in the future to ensure the conditions are being met. This re-evaluation could result in requiring disinfection of the effluent at that time.

Attachment #3 is a map of the area showing the approximate location of Outfall 004.

Existing Permit Limitations

The current permit, expiring on 06/30/2022, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅						2,3
Sept – May			30 mg/L	20 mg/L		
June – Aug			23 mg/L 19 lbs/day	20 mg/L		
TSS						2
Sept – May			30 mg/L	20 mg/L		
June – Aug			23 mg/L	20 mg/L		
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen						2,3
Sept – May		4.0 mg/L				
June – Aug		6.0 mg/L				
Ammonia Nitrogen						
March	37 mg/L		40 mg/L	33 mg/L		
April	37 mg/L		19 mg/L	11 mg/L		
May – June	21 mg/L		28 mg/L	11 mg/L		
July – Sept	21 mg/L		24 mg/L	9.6 mg/L		
October	21 mg/L		29 mg/L	16 mg/L		
November	21 mg/L		28 mg/L	16 mg/L		
December	21 mg/L		31 mg/L	16 mg/L		
January – February	37 mg/L		31 mg/L	25 mg/L		
Phosphorus						4

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Interim				Narrative		
Final				0.225 mg/L	0.075 mg/L	
Chloride			680 mg/L			5
WET						6

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code. The weekly average BOD₅ limit and dissolved oxygen limit for June – August was included to be protective of the Grand River downstream when limits for a direct discharge to the river were calculated to be below 45 mg/L.
4. A compliance schedule is in the current permit to meet the final WQBEL by 07/01/2026.
5. This is an interim variance limit.
6. Acute and chronic WET tests are required 3/permit term. The instream waste concentration (IWC) for chronic WET tests is 46%.

Receiving Water Information

- Name: Unnamed tributary to the Grand River
- Waterbody Identification Code (WBIC): 163100
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited aquatic life (LAL) community, non-public water supply. The LAL classification is listed in NR 104 Wis. Adm. Code from the outfall to the confluence with the Grand River, which is approximately one-third of a mile downstream of Outfall 004. The Grand River is classified as a warmwater sport fish (WWSF) community, non-public water supply.
 Note: Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q₁₀ and 7-Q₂ values are estimates from USGS, where Outfall 004 is located.
 7-Q₁₀ = 0 cfs (cubic feet per second)
 7-Q₂ = 0 cfs
 Low flows at the Grand River, where the warmwater sport fishery classification begins 1/3rd of a mile downstream of Outfall 004, are shown below:
 7-Q₁₀ = 0.37 cfs
 7-Q₂ = 1.0 cfs
- Hardness = 352 mg/L as CaCO₃ (n=4). This value represents the geometric mean of data from 09/09/2014 to 10/19/2021 from chronic WET tests.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Source of background concentration data: Background concentrations are not included because they don't impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None.
- Impaired water status: The immediate receiving water is not listed as impaired. The Grand River, approximately one-third of a mile downstream of Outfall 004, is 303(d) listed as impaired for total

phosphorus.

Effluent Information

- Design flow rate(s):
 - Annual average = 0.051 MGD (Million Gallons per Day)
 - Peak daily = 0.22 MGD
 - Peak weekly = 0.13 MGD
 - Peak monthly = 0.10 MGD
- For reference, the actual average flow from 07/01/2017 to 11/30/2021 was 0.036 MGD.
- Hardness = 406 mg/L as CaCO₃. This value represents the geometric mean of data from the permit reissuance application from 11/13/2021 to 11/22/2021.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells.
- Additives: Fairwater is planning on using a rare earth additive for phosphorus removal.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Effluent Copper Data

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
11/13/2021	18	11/25/2021	18	12/07/2021	21
11/16/2021	18	11/28/2021	18	12/10/2021	22
11/19/2021	17	12/01/2021	25	12/13/2021	22
11/22/2021	18	12/04/2021	22		
1-day P ₉₉ = 27 µg/L					
4-day P ₉₉ = 23 µg/L					

Effluent Chloride Data

	Chloride mg/L
1-day P ₉₉	636
4-day P ₉₉	461
30-day P ₉₉	368
Mean	322
Std	104
Sample size	247
Range	151 – 731
Date range	12/04/2017 – 01/19/2023

The following table presents the average concentrations and loadings at Outfall 004 from 07/01/2017 to 11/30/2021 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD ₅	2.5 mg/L*	0.11 lbs/day
TSS	1.7 mg/L*	
pH field	7.2 s.u.	
Dissolved Oxygen	10.9 mg/L	
Phosphorus	4.12 mg/L	
Ammonia Nitrogen	2.37 mg/L*	
Chloride	322 mg/L	

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P₉₉) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q₁₀

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Adm. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q₁₀ receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(\text{WQC}) (Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)}{Q_e}$$

Where:

WQC = Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Q_s = average minimum 1-day flow which occurs once in 10 years (1-day Q₁₀)
 if the 1-day Q₁₀ flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q₁₀).

Q_e = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

F = Fraction of the effluent flow that is withdrawn from the receiving water, and

C_s = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)€ , Wis. Adm. Code.

Attachment #1

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for Fairwater.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340	340	68.0	1.66		
Cadmium	406	144.0	144	28.8	<0.025		
Chromium	301	4446	4446	889	<0.038		
Copper	406	58.2	58.2			27	25
Lead	356	365	365	72.9	<4.3		
Nickel	268	1080	1080	216	<0.037		
Zinc	333	345	345	68.9	34		
Chloride (mg/L)		757	757			636	731

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

** Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-Q₁₀ flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152	152	30.4	1.66	
Cadmium	175	3.82	3.82	0.80	<0.025	
Chromium	301	326	326	65.2	<0.038	
Copper	352	30.4	30.4			23
Lead	352	94.5	94.5	18.9	<4.3	
Nickel	268	169	169	33.8	<0.037	
Zinc	333	345	345	68.9	34	
Chloride (mg/L)		395	395			461

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

Monthly Average Limits based on Wildlife Criteria (WC)

The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HTC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	880	880	176	<0.025
Chromium (+3)	8400000	8400000	1680000	<0.038
Lead	2240	2240	448	<4.3
Nickel	110000	110000	22000	<0.037

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	40	40	8.0	1.66

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

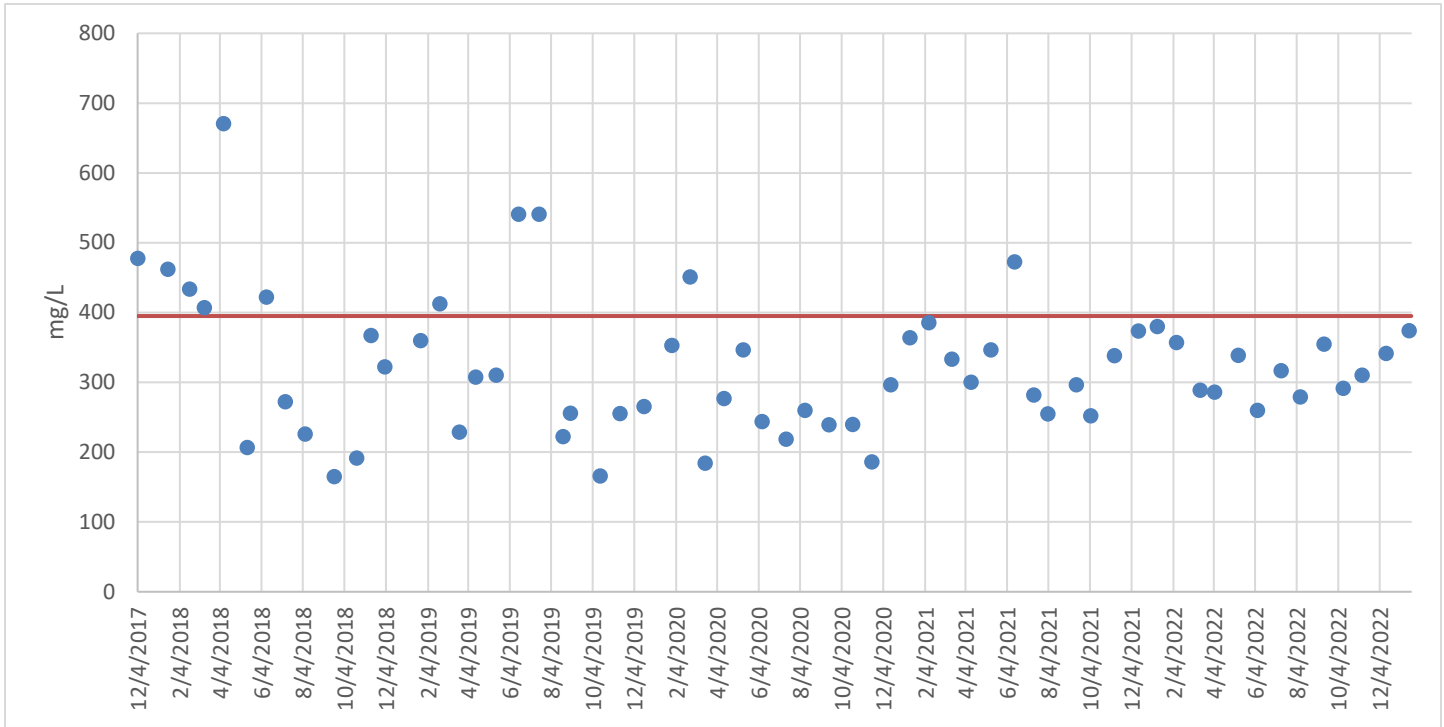
Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for chloride.

Chloride – Considering available effluent data from the current permit term (12/04/2017 – 01/19/2023), the 1-day P₉₉ chloride concentration is 636 mg/L, and the 4-day P₉₉ of effluent data is 461 mg/L. Because the 4-day P₉₉ exceeds the calculated weekly average WQBEL, an effluent limit is needed in accordance with s. NR 106.05(4)(b), Wis. Adm. Code. Fairwater currently has a chloride variance, but they have not reapplied for a variance and are therefore subject to the calculated WQBEL.

Below is a graph of the calculated WQBEL and the 4-day average chloride concentrations reported during the current permit. Bonduelle, a local vegetable processing facility, was discharging high chlorides to sanitary prior to December 2017 because the facility was using softeners rather than their RO unit during the cold weather. The RO unit has been moved inside so the softeners are no longer used. Therefore, chloride data prior to this has been removed in this evaluation because it is not representative of current conditions.

Attachment #1
Effluent Chloride Data



Because Fairwater is subject to the WQBEL of 400 mg/L, a weekly average mass limit of **170 lbs/day** (400 mg/L x 0.051 MGD x 8.34) is required based on the annual average design flow. A wet weather mass limit of **434 lbs/day** (400 mg/L x 0.13 MGD x 8.34) is also required based on the peak weekly design flow.

Expression of limits

Per chs. NR 106 and 205, Wis. Adm. Code, whenever limit is needed, a weekly average limit and monthly average limits are required for continuous discharges subject to ch. NR 210.

The methods for calculating limitations for continuous discharges subject to ch. NR 210 to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(3), Wis. Adm. Code, and are as follows:

Whenever a weekly average limitation is determined necessary to protect water quality, a monthly average limitation shall also be included in the permit and set equal to the weekly average limit unless a more restrictive limit is already determined necessary to protect water quality.

Because a weekly average chloride limit of 400 mg/L is needed, a monthly average limit equal to the weekly average limit is required. Therefore, **it is recommended that the reissued permit also include a monthly average limit of 400 mg/L.**

Mercury – The permit application did not require monitoring for mercury because Fairwater is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3., Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of

influent and effluent mercury monitoring once every three months if, “there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5).” However, sludge sampling is not available because Fairwater is a recirculating sand filter and generates solids which are hauled away as septage. It is not expected that there are exceedances of the high-quality mercury concentration based on similar municipal treatment plants and the lack of industries. **No monitoring is recommended.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(3)(b), Wis. Adm. Code. Based on the effluent flow rate and the lack of industrial discharges contributing to the collection system, **PFOS and PFOA monitoring is not recommended.** PFOS and PFOA monitoring may be required in the future if information becomes available that indicates PFOS or PFOA may be present in the discharge.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has daily maximum, weekly average and monthly average limits. These limits are re-evaluated at this time due to the following changes:

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The maximum expected effluent pH has changed

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

Daily maximum limitations are based on acute toxicity criteria in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation:

$$\text{ATC in mg/L} = [A \div (1 + 10^{(7.204 - \text{pH})})] + [B \div (1 + 10^{(\text{pH} - 7.204)})]$$

Where:

A = 0.633 and B = 90.0 for Limited Aquatic Life, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 872 sample results were reported from 07/03/2017 to 01/30/2023. The maximum reported value was 8.0 s.u. (Standard pH Units). The effluent pH was 8.0 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.1 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.0 s.u. Therefore, a value of 8.0 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.0 s.u. into the equation above yields an ATC = 13 mg/L.

Potential Changes to Daily Maximum Ammonia Nitrogen Effluent Limitations

Subchapter IV of ch. NR 106, Wis. Adm. Code (effective September 1, 2016) specifies methods for the use of the 1-Q₁₀ receiving water low flow to calculate daily maximum ammonia nitrogen limits if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

Attachment #1

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	26
1-Q ₁₀	13

The 1-Q₁₀ method yields the most stringent limits for Fairwater.

Presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

Daily Maximum Ammonia Nitrogen Limits – WWSF

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	83	7.0 < pH ≤ 7.1	51	8.0 < pH ≤ 8.1	11
6.1 < pH ≤ 6.2	82	7.1 < pH ≤ 7.2	46	8.1 < pH ≤ 8.2	8.8
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	40	8.2 < pH ≤ 8.3	7.3
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	35	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	4.9
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	26	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	22	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.8
6.8 < pH ≤ 6.9	60	7.8 < pH ≤ 7.9	16	8.8 < pH ≤ 8.9	2.4
6.9 < pH ≤ 7.0	56	7.9 < pH ≤ 8.0	13	8.9 < pH ≤ 9.0	2.0

If the variable daily maximum limits are implemented in the permit, the current weekly and monthly average limits would be included because they meet expression of limits requirements per s. NR 106.07(3), Wis. Adm. Code.

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)

The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in Attachment #2. The current limits are summarized below:

Current Ammonia Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
March	37	40	33
April	37	19	11
May – June	21	28	11
July – September	21	24	9.6
October	21	29	16

Attachment #1

November	21	28	16
December	21	31	16
January – February	37	31	25

Effluent Data

The following table evaluates the statistics based upon ammonia data reported 08/01/2017 to 01/30/2023, with those results being compared to the calculated limits to determine the need to include ammonia limits in Fairwater’s permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P₉₉) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

Effluent Ammonia Data

Ammonia Nitrogen mg/L	March	April	May – June	July – Sept
1-day P ₉₉	11.9	10.1	1.86	3.53
4-day P ₉₉	8.00	5.80	1.01	2.09
30-day P ₉₉	5.69	3.60	0.49	0.90
Mean*	4.60	2.63	0.26	0.20
Std	2.18	2.01	0.46	1.99
Sample size	22	20	46	79
Range	<0.04 – 8.42	0.426 – 6.02	<0.04 – 2.18	<0.04 – 8.36
Ammonia Nitrogen mg/L	October	November	December	Jan – Feb
1-day P ₉₉		2.63	15.9	43.8
4-day P ₉₉		1.47	8.78	24.2
30-day P ₉₉		0.73	4.93	13.9
Mean*	0.07	0.42	3.31	9.51
Std	0.10	0.61	3.26	8.86
Sample size	26	27	25	48
Range	<0.18 – 0.36	<0.04 – 2.56	<0.04 – 16.4	0.632 – 33.3

*Values lower than the level of detection were substituted with a zero

Based on this comparison, daily maximum limits are required in the months of December and January – February.

The permit currently has daily maximum, weekly average, and monthly average limits year-round. Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

- (b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Expression of Limits – For a single daily maximum limit

Revisions to ch. NR 106, Wis. Adm. Code, in September 2016 aligned Wisconsin’s WQBELs with 40 CFR § 122.45(d), which specifies that effluent limits for continuous dischargers must be expressed as weekly and monthly averages for publicly owned treatment works and as daily maximums and monthly averages for all other dischargers, unless shown to be impracticable. Because a daily maximum ammonia

Attachment #1

limit is necessary for Fairwater, weekly and monthly average limits are also required under this code revision.

The methods for calculating limitations for municipal treatment facilities to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(3), Wis. Adm. Code, and are as follows:

Whenever a daily maximum limitation is determined necessary to protect water quality, a weekly and monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality.

Because the calculated daily maximum limit year-round is 13 mg/L, the weekly and monthly average limits should be equal to 13 mg/L unless the current limits are more restrictive. The current weekly average limits year-round are less restrictive than 13 mg/L so all weekly average limits are recommended to be 13 mg/L. The current monthly average limits for the months of October – March are less restrictive than 13 mg/L, so the monthly average limits are recommended to be 13 mg/L. The current monthly average limits for April – September are more restrictive than 13 mg/L, so these limits are recommended to remain the same.

Conclusions and Recommendations

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code. Limits to meet the requirements in s. NR 106.07, Wis. Adm Code are shown below in bold.

Final Ammonia Nitrogen Limits – single daily maximum limit option

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
March	13	13	13
April	13	13	11
May – June	13	13	11
July – September	13	13	9.6
October	13	13	13
November	13	13	13
December	13	13	13
January – February	13	13	13

Final Ammonia Nitrogen Limits – variable daily maximum limit option

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
March	Variable	40	33
April	Variable	19	11
May – June	Variable	28	11
July – September	Variable	24	9.6
October	Variable	29	16
November	Variable	28	16
December	Variable	31	16
January – February	Variable	31	25

Attachment #1
PART 4 – PHOSPHORUS

Technology-Based Effluent Limit

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Fairwater does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance to s. NR 217.04(1)(a)1, Wis. Adm. Code, and therefore no technology-based limit is required.

Annual Average Mass Total Phosphorus Loading

Month	Monthly Avg. mg/L	Total Flow MG/month	Total Phosphorus lb./mo.
Dec 2020	3.40	1.62	46.0
Jan 2021	3.90	1.47	47.9
Feb 2021	4.44	1.34	49.7
Mar 2021	4.60	1.69	64.8
Apr 2021	5.27	1.66	73.1
May 2021	5.89	1.53	75.2
Jun 2021	5.47	1.73	79.0
Jul 2021	5.34	2.40	107
Aug 2021	4.42	2.64	97.3
Sep 2021	4.67	2.47	96.4
Oct 2021	4.47	2.22	82.8
Nov 2021	4.98	1.39	57.6
Average			73.1

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
 Where total flow is the sum of the actual (not design) flow (in MGD) for that month

In addition, the need for a WQBEL for phosphorus must be considered.

TMDL Limits – Phosphorus

Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (April 2020) and are based on the annual phosphorus wasteload allocation (WLA) given in pounds per year. This WLA found in Appendix H of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf River Basins (UFW TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). The annual WLA is 27 lbs/year.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the UFW TMDL are given monthly average mass limits and, if the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

Attachment #1

$$\begin{aligned} \text{TP Equivalent Effluent Concentration} &= \text{WLA} \div (\text{365 days/yr} * \text{Flow Rate} * \text{Conversion Factor}) \\ &= 27 \text{ lbs/yr} \div (\text{365 days/yr} * 0.051 \text{ MGD} * 8.34) \\ &= 0.17 \text{ mg/L} \end{aligned}$$

Since this value is less than 0.3 mg/L, both a six-month average mass limit and a monthly average mass limit are applicable for total phosphorus. The monthly average limit is set equal to three times the six-month average limit.

$$\begin{aligned} \text{TP 6-Month Average Permit Limit} &= \text{WLA} \div \text{365 days/yr} * \text{multiplier} \\ &= (27 \text{ lbs/yr} \div \text{365 days/yr}) * 1.20 \\ &= 0.088 \text{ lbs/day} \end{aligned}$$

$$\begin{aligned} \text{TP Monthly Average Permit Limit} &= \text{TP 6-Month Average Permit Limit} * 3 \\ &= 0.088 \text{ lbs/day} * 3 \\ &= 0.27 \text{ lbs/day} \end{aligned}$$

The multiplier used in the six-month average calculation was determined according to the implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.4. This is the standard deviation divided by the mean of mass data. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

Six-month average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to a concentration of 0.21 mg/L and 0.61 mg/L at the facility design flow of 0.051 MGD.

The UFW TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries to the Upper Fox and Wolf River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required.

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TP. Rolling 12-month sums can be compared directly to the annual wasteload allocation.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 07/03/2017 – 06/27/2022. Data from 07/05/2022 – 01/30/2023 is shown separately in the table below which was collected during the pilot study using a rare earth additive for additional phosphorus removal.

Total Phosphorus Effluent Data

	Phosphorus mg/L	Phosphorus lbs/day	Phosphorus during pilot study mg/L
1-day P ₉₉	8.06	2.95	6.22
4-day P ₉₉	5.95	1.96	3.58

Attachment #1

30-day P ₉₉	4.82	1.45	2.24
Mean	4.25	1.21	1.64
Std	1.28	0.53	1.23
Sample size	262	260	31
Range	0.19 – 15	0.081 – 5.55	0.31 – 4.86

Multi-Discharge Variance Interim Limit

With the permit application, Fairwater has applied for the phosphorus multi-discharger variance (MDV). Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. A review of effluent phosphorus data indicates that Fairwater will be unable to comply with the 0.8 mg/L phosphorus limits required under s. 283.16 (6) (a) 1., Wis. Stats. Therefore, the recommended interim limit, pursuant to s. 283.16 (6) (am), Wis. Stats., is 1.0 mg/L as a monthly average. A compliance schedule may be appropriate to meet this interim limit but compliance with 1.0 mg/L shall be no later than the end of the reissued permit.

The effluent data indicates that 4-day P₉₉ value of **6.0 mg/L is a level currently achievable (LCA)** for the discharge. A limit of 6.0 mg/L as a monthly average should not be exceeded during the compliance schedule.

PART 5 – TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (April 2020). This WLAs found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf Basins (UFW TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). The annual WLA for Fairwater is 1,864 lbs/year.

Revisions to chs. NR 106 and 205, Wis. Adm. Code align Wisconsin water quality-based effluent limits with 40 CFR 122.45(d), which requires WPDES permits to contain the following concentration limits, whenever practicable and necessary to protect water quality:

- Weekly average and monthly average limitations for continuous discharges subject to ch. NR 210.
- Daily maximum and monthly average limitations for all other discharges.

Fairwater is a municipal treatment facility and is therefore subject to weekly average and monthly average TSS limits derived from TSS annual WLAs.

$$\begin{aligned} \text{TSS Weekly Average Permit Limit} &= \text{Daily WLA} * \text{Weekly multiplier} \\ &= 5 \text{ lbs/day} * 3.11 \\ &= 16 \text{ lbs/day} \end{aligned}$$

$$\begin{aligned} \text{TSS Monthly Average Permit Limit} &= \text{Daily WLA} * \text{Monthly multiplier} \\ &= 5 \text{ lbs/day} * 1.90 \\ &= 9.5 \text{ lbs/day} \end{aligned}$$

The multiplier used in the weekly average and monthly average calculation was determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 1.3. This is the standard deviation divided by the mean of mass data. However, it is believed that the

optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies TSS monitoring as 3/week; if a different monitoring frequency is used, the stated limits should be reevaluated.

Weekly average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to concentrations of 37 mg/L and 22 mg/L at the facility design (maximum annual average for industries) flow of 0.051 MGD.

Since wasteload allocations are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits should require the permittee to calculate and report rolling 12-month sums of total monthly loads for TSS. Rolling 12-month sums can be compared directly to the annual wasteload allocation.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 07/03/2017 – 11/29/2021.

Total Suspended Solids Effluent Data

	TSS mg/L	TSS lbs/day
1-day P ₉₉	8.2	3.0
4-day P ₉₉	5.2	1.7
30-day P ₉₉	2.9	0.86
Mean	1.9	0.52
Std	1.7	0.67
Sample size	294	294
Range	0 – 13	0 – 5.0

Fairwater can currently meet the TSS mass limits of 16 lbs/day as a weekly average and 9.5 lbs/day as a monthly average based on mass data from their current permit term. Therefore, **the TMDL mass limits are recommended to be effective immediately upon permit reissuance.**

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in Chapters NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as Limited Aquatic Life according to s. NR 104.02(3)(b)1, Wis. Adm. Code, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 and described in s. NR 106.55(2), Wis. Adm. Code, which has a daily maximum effluent temperature limitation of 120 °F. The 86 °F limit applies because the hydrologic classification is not listed as wetland in ch. NR 104, Wis. Adm. Code.

Reasonable Potential

Section NR 106.59(2)(b), Wis. Adm. Code, allows the use of temperature effluent data, on a case-by-case

basis, from at least two other POTWs within a 100-mile radius that utilize similar wastewater treatment technology and have a similar ratio of domestic to industrial waste stream composition, or representative data of the POTW.

The maximum daily temperature from Markesan WWTF, approximately 6 miles away, was 71° F over the previous ten years. The maximum daily temperature from Brandon WWTF, approximately 5 miles away, was 70° over the previous ten years. Based on the available effluent data from the two similar facilities, **no effluent limits are recommended for temperature. Monitoring for one year is recommended in the reissued permit to determine reasonable potential during the next evaluation.**

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (October 29, 2019)*.

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of **46%** shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$\text{IWC (as \%)} = Q_e \div \{(1 - f) Q_e + Q_s\} \times 100$$

Where:

Q_e = annual average flow = 0.051 MGD = 0.079 cfs

f = fraction of the Q_e withdrawn from the receiving water = 0

Q_s = ¼ of the 7- Q_{10} = 0.37 cfs ÷ 4 = 0.093 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 004 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.

Attachment #1

- Shown below is a tabulation of all available WET data for Outfall 004. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC ₅₀ %				Chronic Results IC ₂₅ %					Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Algae (IC ₅₀ %)	Pass or Fail?	Use in RP?	
09/06/2007	31.86	>100	Fail	No	15.64	80.88		Fail	No	1
11/27/2007	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
08/13/2013	>100	>100	Pass	Yes	25	>100	54.1	Fail	No	2
04/22/2014	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
09/09/2014	>100	>100	Pass	Yes	>100	>100	>100	Pass	Yes	
09/11/2018	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
07/09/2019	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
10/19/2021	>100	>100	Pass	Yes	>100	>100		Pass	Yes	

Footnotes:

1. *Data Not Representative.* WWTP, industrial processes or contributions, or other significant changes have occurred which renders data unrepresentative. The source of toxicity was identified as a water softening system for an industrial contributor, a local vegetable cannery. The industry ceased discharging zeolite softening regeneration wastes to the sanitary sewer system.
2. *Qualified or Inconclusive Data.* Data quality concerns were noted during testing which calls into question the reliability of the test results.

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

$$\text{Acute Reasonable Potential} = [(TUa \text{ effluent}) (B)(AMZ)]$$

$$\text{Chronic Reasonable Potential} = [(TUc \text{ effluent}) (B)(IWC)]$$

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC₅₀, IC₂₅ or IC₅₀ ≥ 100%).

Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.
Chronic Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and

Attachment #1

suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: <https://dnr.wisconsin.gov/topic/Wastewater/WET.html>.

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. 0 Points	IWC = 46%. 10 Points
Historical Data	7 tests used to calculate RP. No tests failed. 0 Points	6 tests used to calculate RP. No tests failed. 0 Points
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. 0 Points	Same as Acute. 0 Points
Receiving Water Classification	LAL with less than 4 miles to WWSF 5 Points	Same as Acute. 5 Points
Chemical-Specific Data	Reasonable potential for limits for ammonia based on ATC; Arsenic, copper, zinc, and chloride detected. Additional Compounds of Concern: None 8 Points	Reasonable potential limits for chloride based on CTC; Ammonia nitrogen limit carried over from the current permit. Arsenic, ammonia, copper, and zinc detected. Additional Compounds of Concern: None 8 Points
Additives	0 Biocides and 1 Water Quality Conditioners added. Permittee has proper P chemical SOPs in place: No 16 Points	Additives used more than once per 4 days. 16 Points
Discharge Category	0 Industrial Contributors. 0 Points	Same as Acute. 0 Points
Wastewater Treatment	Secondary treatment 0 Points	Same as Acute. 0 Points
Downstream Impacts	No impacts known 0 Points	Same as Acute. 0 Points
Total Checklist Points:	29 Points	39 Points
Recommended Monitoring Frequency (from Checklist):	3 tests/permit term	1x yearly
Limit Required?	No	No

Attachment #1

	Acute	Chronic
TRE Recommended? (from Checklist)	No	No

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2019) and other information described above, 3x/permit term acute WET tests and 1x yearly chronic WET tests are recommended in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).

If Fairwater submits an approvable SOP for the rare earth additive for phosphorus removal, 15 points would be removed from the acute and chronic checklists. This would result in the recommendation of **no acute WET testing and 2/permit term chronic WET testing.**

Attachment #2
Village of Fairwater WWTF
Effluent Limitations for Ammonia Nitrogen based on Chronic Toxicity Criteria
At Outfall 004 – Limited Aquatic Life

Weekly and monthly average limits – tributary:

Chronic toxicity criteria for ammonia are related to ambient pH and temperature, with ammonia being more toxic in either higher pH or warmer waters. Although there is zero background flow in the tributary at low flow conditions, default ambient pH values are used to calculate criteria instead of effluent pH with no dilution, because in harder waters such as those found in the southern half of Wisconsin, instream pH tends to approach default values. In addition, as noted earlier, ambient temperatures are now available for small streams in Wisconsin as part of the 2010 thermal standards. Using this information, the following weekly and monthly average ammonia limits are calculated for the tributary and its Limited Aquatic Life classification (criteria/limits are rounded to two significant digits):

	Jan. – Mar.	Apr. – June	July – Sept.	Oct. – Dec.
Temp. (°F)	43	64	69	55
pH (s.u.)	7.90	8.09	8.08	8.06
4-day Criterion (weekly ave. limit)	79	28	24	41
30-day Criterion (monthly ave. limit)	31	11	9.6	16

Background temperatures represent the highest temperatures listed for the indicated months in Limited Forage Fish waters in Table 2 of ch. NR 102. Although the tributary isn't classified for Limited Forage Fish, ambient temperatures are not available for Limited Aquatic Life waters because thermal criteria in that classification do not vary seasonally.

Attachment #2
Village of Fairwater WWTF
Effluent Limitations for Ammonia Nitrogen based on Chronic Toxicity Criteria
At the Grand River – Warmwater Sport Fishery

Weekly and monthly average limits – Grand River:

Unlike the tributary, dilution with an appropriate effluent and stream flow may be considered in the Grand River in order to meet criteria based on the warmwater sport fish classification. The 7Q10 low flow is used to calculate weekly average limits based on 4-day chronic criteria while 85% of the 7Q2 low flow is used to calculate monthly average limits based on 30-day chronic criteria. The relative dilution factors are also modified by a percentage of streamflow used for mixing which varies seasonally, as well as the fact the design discharge rate at Fairwater also varies on a seasonal basis (due to variations in industrial contribution). The tables on the following page summarize the calculation of chronic toxicity criteria and weekly and monthly average effluent limits based on protection of downstream uses in the Grand River:

In the tables on the following page, default temperatures are based on small warmwater streams according to Table 2 of ch. NR 102, the results are slightly different than those used for the tributary because the seasonal months are arranged differently based on the 2003 preliminary evaluation. Default pH values are based on actual seasonal data in the Grand River.

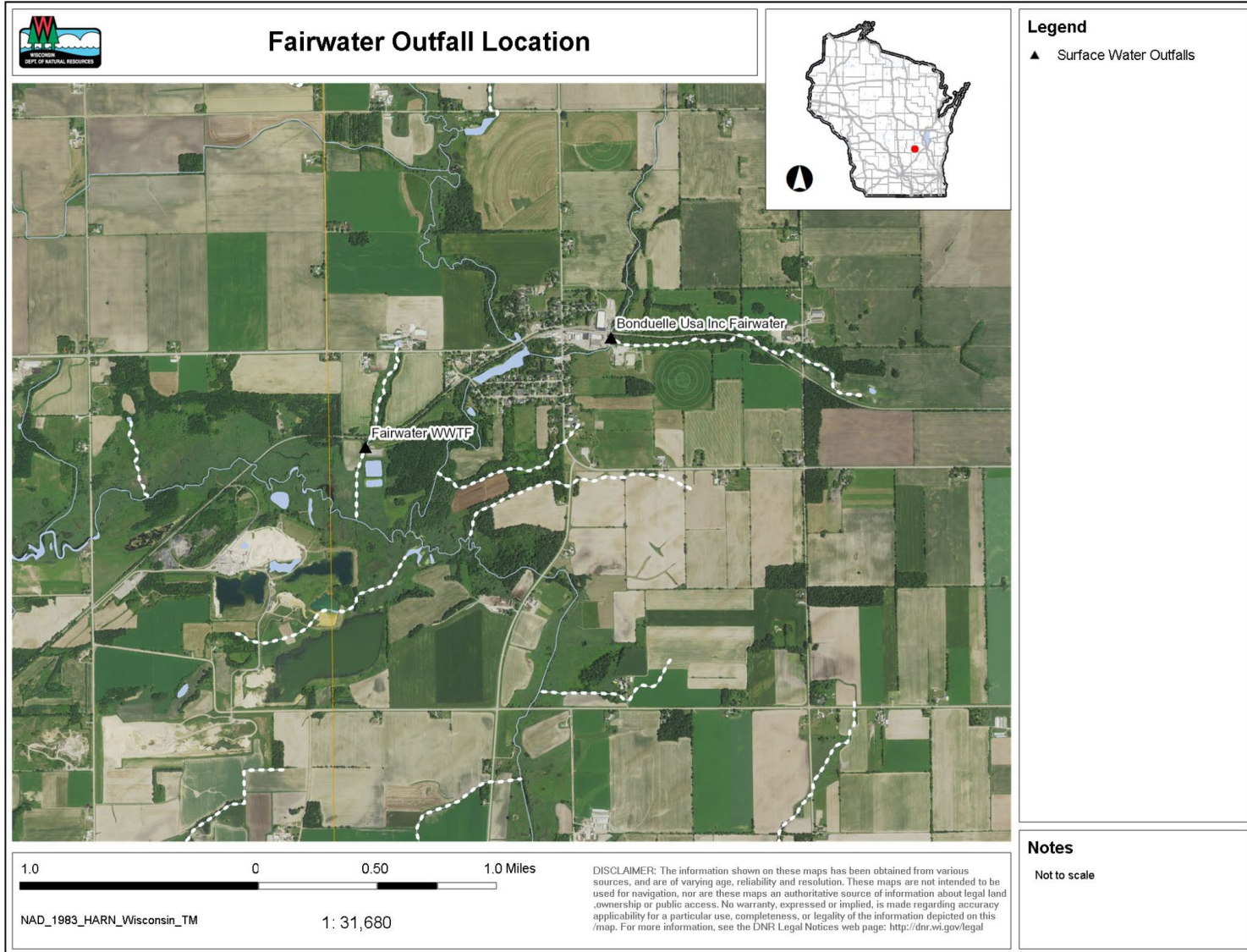
Attachment #2

Month:	July	Aug.	Sept.	Oct.	Nov.	Dec.
Temp. (°F)	69	67	60	50	40	35
pH (s.u.)	7.93	7.93	7.93	7.93	8.28	8.28
7Q10 (cfs)	0.6	0.6	0.7	0.7	0.7	0.8
7Q2 (cfs)	1.6	1.6	1.9	1.9	1.9	2.2
Effluent design flow (MGD)	0.1	0.1	0.1	0.05	0.034	0.034
4-day Criterion, Early Life Stages:						
Present (mg/L)	4.55	4.89	6.28			
Absent (mg/L)				8.99	6.39	6.39
Weekly Average Limit (mg/L)	22	24	20	29	28	31
30-day Criterion, Early Life Stages:						
Present (mg/L)	1.82	1.96	2.51			
Absent (mg/L)				3.59	2.56	2.56
Monthly Average Limit (mg/L)	17	19	15	22	22	25

Month:	Jan.	Feb.	March	April	May	June
Temp. (°F)	33	34	38	48	58	66
pH (s.u.)	8.28	8.28	8.28	8.28	7.93	7.93
7Q10 (cfs)	0.8	0.8	1.1	1.1	1.1	0.6
7Q2 (cfs)	2.2	2.2	3.0	3.0	3.0	1.6
Effluent design flow (MGD)	0.034	0.034	0.034	0.045	0.045	0.1
4-day Criterion, Early Life Stages:						
Present (mg/L)				3.94	6.71	5.07
Absent (mg/L)	6.39	6.39	6.39			
Weekly Average Limit (mg/L)	31	31	40	19	59	25
30-day Criterion, Early Life Stages:						
Present (mg/L)				1.57	2.69	2.03
Absent (mg/L)	2.56	2.56	2.56			
Monthly Average Limit (mg/L)	25	25	33	16	51	19

Attachment #2

Month:	Weekly Average – tributary	Weekly Average – Grand River	<i>Weekly Average (current permit)</i>	Monthly Average – tributary	Monthly Average – Grand River
January	79	31		31	25
February	79	31		31	25
March	79	40		31	33
April	28	19	38	11	16
May	28	59	15	11	51
June	28	25	2.2	11	19
July	24	22	2.2	9.6	17
August	24	24	2.2	9.6	19
September	24	20	5.1	9.6	15
October	41	29	13	16	22
November	41	28	32	16	22
December	41	31		16	25



Mail Complete Application to:

Wisconsin Department of Natural Resources
 Permits Section-WQ/3
 PO Box 7921
 Madison, WI 53707-7921

**Phosphorus Multi-Discharger
 Variance Application for Municipal
 Facilities** - s. 283.16, Wis. Stats.

Form 3200-150 (R 03/17)

Page 1 of 5

Notice: Pursuant to s. 283.16, Wis. Stats, an owner of an existing permitted wastewater treatment system may apply for a variance to a phosphorus water quality based effluent limits (WQBEL). Complete this form and submit to the Department of Natural Resources (DNR) to request coverage under the multi-discharger variance (MDV) for phosphorus. Personal information collected will be used for administrative purposes and may be provided to requestors to the extent required by Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats.]

Facility and Permit Information				Facility Contact Information		
WPDES Permit No. WI- 0 0 2 1 4 4 0				Contact Name Jerry Lind		
Facility Name Village of Fairwater WWTF				Title Director of Public Works		
Facility Street Address W14476 STH 44				Address 407 Main Street; P.O. Box 15		
City Fairwater	State WI	ZIP Code 53931	City Fairwater	State WI	ZIP Code 53931	
Receiving Water Unnamed Tributary(163100)	County Fond Du Lac	Phone No. (incl. area code) (920) 346-5718		Fax Number (920) 346-5728		
Source of Water Supply Groundwater	Average Discharge Flow Rate 0.040	Email Address fairwaterutility@gmail.com				

Variance Request Schedule	Check all that apply:
---------------------------	-----------------------

- | | |
|--|-------------------------------------|
| 1. This variance is being requested at the time of application for permit reissuance pursuant to s. 283.16(4)(b)1, Wis. Stat. | <input checked="" type="checkbox"/> |
| 2. This variance is being requested within 60 days after the department reissues or modifies the permit to include a phosphorus WQBEL pursuant to s. 283.16(4)(b)2, Wis. Stat. | <input type="checkbox"/> |
| 3. This variance is being requested from a current WPDES Permit pursuant to 283.16(4)(b)3, Wis. Stat. | <input type="checkbox"/> |

Date of Current Permit Issuance: _____

Note: WPDES permit must be issued prior to April 2014.

4. Has the MDV been included in previously issued WPDES Permits?
 Yes
 How many permits has the MDV been approved for? _____
 No

Variance Requirements

- | | |
|---|--|
| 5. Has this point source discharge been authorized by a WPDES permit prior to December 1, 2010? | <input checked="" type="radio"/> Yes
<input type="radio"/> No |
| 6. Has this point source relocated its outfall location since December 1, 2010? | <input type="radio"/> Yes
<input checked="" type="radio"/> No |
| 7. Is the point source located in an eligible MDV county as specified in Appendix H of the MDV Implementation Guidance? | <input checked="" type="radio"/> Yes
<input type="radio"/> No |

Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat.

8. Does this limit require a major facility upgrade in order to achieve compliance? Yes
 No

Justify:

See the Final Compliance Alternatives Plan (MSA Professional Services, Inc.; May 2022) previously submitted to the Department.

Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat. STOP. A major facility upgrade means that a facility needs to install new equipment and a new process such as installing filtration or

9. Phosphorus Water Quality-Based Effluent Limitation from which variance is sought:
- Concentration-based WQBEL pursuant to s. NR 217.13, Wis. Adm. Code
 - TMDL mass-based WQBEL pursuant to s. NR 217.16, Wis. Adm. Code

Check all months for which variance is requested:

All months

- | | | | |
|---|---|---|---|
| <input checked="" type="checkbox"/> Jan | <input checked="" type="checkbox"/> Apr | <input checked="" type="checkbox"/> Jul | <input checked="" type="checkbox"/> Oct |
| <input checked="" type="checkbox"/> Feb | <input checked="" type="checkbox"/> May | <input checked="" type="checkbox"/> Aug | <input checked="" type="checkbox"/> Nov |
| <input checked="" type="checkbox"/> Mar | <input checked="" type="checkbox"/> Jun | <input checked="" type="checkbox"/> Sep | <input checked="" type="checkbox"/> Dec |

10. Do you believe these limits could be achieved during the term of the permit? Yes
 No

11. Current effluent quality

Note: Use 30-day P99 if 11 or more representative effluent samples are present. Only include effluent data for those outfall(s) a variance is being requested for.

Outfall Number(s)	Conc. (mg/L)	Number of Samples Results Used	Sample Time Period Used	
1	4.64	58	07/01/2017	06/30/2022

12. Are applicable phosphorus limits currently effective in the WPDES permit more restrictive than 1 mg/L? Yes
 No

Facility Information (provide attachments as necessary)

13. What are the average phosphorus levels within your influent TP concentration? 5.58 mg/L

14. Has the treatment process at the facility been optimized to maximize its phosphorus removal capabilities?

Yes

Completion date: 01/01/2023

No, but in process of completing

No, not yet started

15. Has a facility planning or evaluation study for phosphorus been approved by the Department?

Yes

Approval date: _____

No, but in process of completing

No, not yet started

16. Briefly describe the technology that would need to be added to comply with phosphorus limits in your permit:

The chemical addition pilot study showed meeting the interim MDV limit is possible, however it was not proven that chemical addition at the WWTF alone will consistently meet the future TMDL limits. To meet TMDL limits, it is likely water quality trading will need be implemented along with chemical addition facilities at the WWTF. This is discussed on pages 15-16 and 18-19 in the Final Compliance Alternatives Plan (MSA Professional Services, Inc; May 2022) previously submitted to the Department.

Attach any new or additional information that you would like to provide the Department regarding optimization measures and/or compliance alternatives planning efforts.

Projected Compliance Costs

17. What is the projected net present value cost for complying with the phosphorus WQBELs? \$886,000

Source of cost projection:

Engineering Cost Estimate. Estimate was updated from the Final Compliance Alternatives Plan estimate submitted to the Department in March 2022.

Note: If a facility uses projected compliances costs provided in the Economic Impacts Analysis, they must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.

18. Has the feasibility of water quality trading or adaptive management been evaluated for the facility? Yes
 No

19. Is the facility eligible for adaptive management or water quality trading? Yes
 No

20. What is the needed offset to comply with AM/WQT? _____ 128 lbs/year
 Unknown at this time

21. Is adaptive management or water quality trading a viable compliance option? Yes

No

Describe:

Adaptive management is not a viable option because the WWTF must be located within a nonpoint source dominated watershed. The Fairwater WWTF is not nonpoint source dominated, as the point-to-nonpoint ratio is 55:45. Water quality trading alone is not a viable compliance option as the phosphorus reduction needed would be large and significantly expensive. Additional details can be found on pages 18-19 of the "Final Wastewater Facility Plan for Phosphorus Compliance" submitted to the Department on March 10, 2022.

Service Area Information- Provide the following information for each municipality included in the wastewater facility service area.

Municipality Name	County	Population Served	Customer	Median Household
Village of Fairwater	Fond Du Lac	350	159	\$54,821.00

Non-Residential Customers:

Percent of wastewater flow attributed to commercial industrial, large institutional and any other special customer category:

42 %

Describe types of non-domestic wastewater contributions that constitute a significant phosphorus contribution or that significantly affect the capabilities of the treatment facility. Examples include: large food processors, dairies, or industries with unique wastewater.

None.

Affordability to Municipal Dischargers

22. What is the projected household user charge, expressed as a percent of MHI, once phosphorus compliance costs are factored in?

1.211 %

Attach supporting information on a separate attachment to this form. The applicant may also provide additional information on impacts to commercial, industrial, or other special customers or any other information regarding affordability.

23. What is the secondary indicator score for the county (counties) in which the service area is located in?

5

*Note: See Appendix A of the MDV Implementation Guidance for details.
If the service area is located in multiple counties, provide the weighted average value.*

Watershed Project. Select one of the following watershed project options:

Option A. County payment contribution

Option B. Binding, written agreement with the DNR to construct a project or implement a watershed plan.

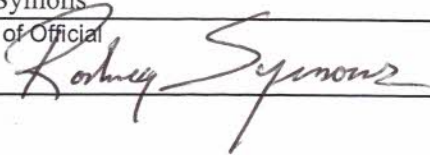
Submit Form 3200-148 with MDV application

Option C. Binding, written agreement with another entity that is approved by the DNR to construct a project or implement a watershed plan.

Submit Form 3200-148 with MDV application.

Certification

Based on the information provided, I believe that my permitted facility qualifies for coverage under the multi-discharger phosphorus variance based on the requirements of s. Wis. Stat. 283.16 (4), Wis. Stat. I understand that as a condition of the variance, the Department will impose interim limitations and require a watershed project or plan to be completed as part of the phosphorus reduction measures for phosphorus during the term of the variance in accordance with s. Wis. Stat. 283.16(6). I understand that these conditions will be included in the WPDES permit issued to this facility and I agree to comply with all applicable permit conditions for this variance. I hereby certify that the determination in Wis. Stat. 283.16(2)(a) applies to my permitted facility and that my permitted facility cannot otherwise comply with its phosphorus water quality based effluent limitations without a major facility upgrade. To the best of my knowledge, the information in this application is true, accurate, and complete.

Print or type name of person submitting request (Individual must be an Authorized Representative) Rodney Symons	Title Village President
Signature of Official 	Date Signed 5/18/2023

EFFLUENT VARIABILITY ANALYSIS -					result_amt
=	=	=	=	=	4.76
SUBSTANCE:					5.05
NUMBER OF VALUES:	-----				4.57
TOTAL	58				3.29
DETECTED	58				4.23
NON-DETECTED	0				3.93
d	0				5.19
					4.04
m	4.25				4.80
					4.66
mean of all data	4.245875				3.44
					5.08
s	0.89458				5.09
					5.03
					2.38
	-----	-----	-----		2.42
n	1	4	30		5.88
					3.47
d^n	0	0	0		3.91
					4.08
p	0.99	0.99	0.99		3.63
					4.51
Z_p	2.326785	2.326785	2.326785		4.05
					4.11
					3.89
1+(s/m)^2	1.044392	1.044392	1.044392		3.24
					3.62
(sigma_d)^2	0.043435	0.043435	0.043435		3.00
					2.84
mu_d	1.424231	1.424231	1.424231		3.03
					3.62
					4.07
(sigma_dn)^2	0.043435	0.011037	0.001479		2.83
					3.62
mu_dn	1.424231	1.44043	1.445209		4.18
					3.85
					4.30
P_99 exponent	1.909156	1.684873	1.534681		4.23
					3.11
	-----	-----	-----		3.11
P_99	6.75	5.39	4.64		3.12
	-----	-----	-----		3.40
					3.90
minimum	2.378				4.44
maximum	5.894				4.60
					5.27
					5.89
NOTES: For purposes of this summary, ^ represents an exponent					5.47
or superscript while _ represents a subscript.					5.34
					4.42
					4.67

4.47
4.98
5.66
5.74
5.43
4.88
5.00
4.58
5.38

Village of Fairwater WWTF Improvements
Fairwater, Wisconsin
Cost Estimate - Chemical Feed System
April 17, 2023

Item	Design Life	Capital Cost	Replacement Cost	Salvage Value
Site Improvements				
Restoration	40	\$10,000		\$5,000
Driveway Improvements	20	\$3,000		
Proposed Chemical Building for Phosphorus Removal				
Building Site Prep and Concrete	40	\$10,000		\$5,000
Building (12' x 10' Prefabricated Building)	30	\$68,000		\$22,667
Chemical Piping, installed (including yard)	30	\$21,000		\$7,000
Chemical Storage Tank and Containment (polyethylene)	30	\$12,000		\$4,000
Chemical Feed Pumps and Controls	10	\$40,000	\$1,400	
Fiberglass Buildings for Influent and Effluent Samplers (2)	30	\$24,000		\$8,000
Electrical (20%)	30	\$38,000		\$12,667
Construction Subtotal		\$226,000	\$1,400	\$64,300
General Contractor				
Mobilization, Bonding, Insurance	7%	\$15,820		
General Conditions	8%	\$18,080		
Overhead and Profit	15%	\$33,900		
Total Estimated Construction Cost		\$293,800		
Capital Contingencies (20%)	20%	\$59,000		
Subtotal		\$353,000		
Professional Services				
Pilot Testing Chemical		\$10,000		
Engineering - Pilot Testing, Abbrev. Facility Plan, Design, Bidding		\$64,000		
CWF Funding Application and Administration		\$42,000		
Engineering Construction Administration and Observation		\$32,000		
Bond Counsel		\$8,000		
Legal, Administration		\$5,000		
Subtotal		\$161,000		
Total Estimated Capital Cost		\$514,000		
Annual Operation and Maintenance Costs				
	Quantity	Units	Unit Cost	Annual Cost
Equipment Repairs & Maintenance	1	LS	\$500	\$500
RE300 Purchase Costs (Includes delivery in 300 gal tote)	1,460	GAL	\$16.00	\$23,400
Annual MDV Fee	23	LBS	\$55.00	\$1,265
Additional Electricity Cost	12	MONTHS	\$120.00	\$1,400
				\$26,600
20 Year Present Worth				
		Cost		Present Worth
Initial Capital Cost		\$514,000		\$514,000
Annual O&M Cost		\$26,600		\$410,000
Salvage Value		\$64,300		(\$38,000)
TOTAL ESTIMATE OF PRESENT WORTH				\$886,000

Note: Present Worth estimated using discount rate =

2.625% FY 2023 Discount Rate

CWF Loan Repayment Schedule

Project Cost	\$ 514,000	% of Project	
Village Funds	\$ -	0.0%	<=== 100% Applied to City loan
CWF Principle Forgiveness	\$ 301,975	58.75%	<=== 100% Applied to City loan
CWF Loan Amount	\$ 212,025		

Parallel Cost Ratio	1.00	
Tier 1 Costs	\$212,025	
Tier 3 Costs	\$0	
Tier 1 Interest Rate	2.145%	<=== 55% of market rate
Tier 3 Interest Rate	3.900%	<=== Market rate (hyperlink)
Composite interest rate (NR162.07 (6))	2.145%	
Assume:	20 year term	
	2 Payments per year	

Payment Schedule: 40 Total payments
\$13,149 Total Annual Debt Service

Date	Payment	Principal	Interest	Balance
				\$212,025
1-May-25	\$13,149	-	\$2,274	\$212,025
1-Nov-25	-	8,601	2,274	203,424
1-May-26	\$13,149	-	2,182	203,424
1-Nov-26	-	8,786	2,182	194,638
1-May-27	\$13,149	-	2,087	194,638
1-Nov-27	-	8,974	2,087	185,664
1-May-28	\$13,149	-	1,991	185,664
1-Nov-28	-	9,166	1,991	176,498
1-May-42	\$13,149	-	406	37,811
1-Nov-42	-	12,338	406	25,473
1-May-43	\$13,149	-	273	25,473
1-Nov-43	-	12,603	273	12,871
1-May-44	\$13,149	-	138	12,871
1-Nov-44	-	12,875	138	(4.00)
Totals	\$262,980	\$212,029	\$50,953	

Revenue Required

Municipal Budget Item	2022	2023	2024	2025
New Debt Service	\$13,149	\$13,149	\$13,149	\$13,149
Excess New Debt Coverage	\$1,315	\$1,315	\$1,315	\$1,315
Existing Debt Service	\$ -	\$ -	\$ -	\$ -
Existing Utility O&M	\$ 80,000	\$ 82,400	\$ 84,872	\$ 87,418
New WWTF O&M	\$ 26,600	\$ 27,398	\$ 28,220	\$ 29,067
New Replacement Fund	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400
Total Revenue Required	\$122,464	\$125,662	\$128,956	\$132,349

Revenue Generated at Current Rates Already Increased by 5% in 2023

Class	Average Quarterly Fixed Charge	Volume Charge	Average Total Annual Charge per User	Revenue Generated by User Class	Revenue Generated by User Class per 2022 Annual Audit + 5%	% Revenue by User Class	Average Monthly Rate	Average Quarterly Rate
Residential	\$116.86	\$5.51	\$664	\$95,611	\$94,702	73.3%	\$55.33	\$166
Commercial	\$139.54	\$5.51	\$694	\$6,943	\$6,128	4.7%	\$57.86	\$174
Industrial		varies	\$25,409	\$25,409	\$25,409	19.7%	\$2,117.45	\$6,352
Public	\$131.52	\$5.51	\$562	\$1,124	\$1,122	0.9%	\$46.82	\$140
Multifamily	\$146.17	\$5.51	\$877	\$1,753	\$1,755	1.4%	\$73.06	\$219
Total				\$130,840	\$129,116	100.0%		<=== verify this matches revenue required
		Estimated 2025 Revenue Requirement:		\$132,349	\$132,349			

Increase volume surcharge to: \$1.86 per 1000 gallons \$3,268 Estimated Increase Industrial Wastewater Revenue (\$1.00/1000 gallons)
 from current \$0.86 per 1000 gallons **\$134,108** <=== verify this matches revenue required

Current Sewer Rates	
Volume	\$5.51 per 1000 gallons
Fixed: 5/8 - 3/4"	\$116.86 Residential (Quarterly)
Fixed: 1 - 1.5"	
Fixed: 2 - 4"	
Fixed: >4"	

Current Average Residential Sewer Cost (based on 2022 use)	
Fixed Charge	\$467.44 per year
Volume Charge	\$196.61 per year
TOTAL	\$664.05 per year
	\$166.01 per quarter
	\$55.34 per month

1.211%
current rate as % of MHI

New Proportionality Check:

	Annual Revenue	% revenue	Annual Flow	% Flow
Residential	\$95,611	71.3%	5,136	56.9%
Commercial	\$6,943	5.2%	247	2.7%
Industrial	\$28,678	21.4%	3,528	39.1%
Public	\$1,124	0.8%	13	0.1%
Multifamily	\$1,753	1.3%	106	1.2%
Total	\$134,108	100.0%	9,030	100.0%

Notice: This checklist is meant to be a tool to help Department of Natural Resources (DNR) staff review municipal and industrial multi-discharger variance (MDV) applications (Forms 3200-149 and 3200-150). Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Permittee Name

Village of Fairwater

WPDES Permit Number WI- 0 0 2 1 4 4 0	County Fond Du Lac
---	------------------------------

1. Did the point source apply for the MDV at the appropriate time?	<input checked="" type="radio"/> Yes <input type="radio"/> No. <i>STOP- facility not eligible at this time.</i>	See Questions 1-3.
2. This operation is (check one):	<input type="radio"/> New or relocated outfall. <i>STOP- facility not eligible.</i> <input checked="" type="radio"/> Existing outfall	See Questions 5-6.
3. Is the point source is located in an MDV eligible area?	<input checked="" type="radio"/> Yes <input type="radio"/> No. <i>STOP- facility not eligible.</i>	Apply County information to Appendix H. Additional information provided in Q7 on municipal form & Q7-8 on industrial form.
4. The secondary indicator score for the county (counties) the discharge is located is:	<u>5</u>	See Appendices A-F. If the score is less than 2, stop; the facility is not eligible. See Q23 on municipal form & Q28 on industrial form.
5. Is a major facility upgrade required to comply with phosphorus limits?	<input checked="" type="radio"/> Yes <input type="radio"/> No. <i>STOP- facility not eligible.</i>	See Q8 on municipal form/Q9 on industrial form.
6. List the months where phosphorus limits cannot be achieved during the permit term:	<input checked="" type="checkbox"/> All <input checked="" type="checkbox"/> Jan <input checked="" type="checkbox"/> Apr <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Feb <input checked="" type="checkbox"/> May <input checked="" type="checkbox"/> Aug <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Mar <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Sep <input checked="" type="checkbox"/> Dec	Consider checking with limit calculator. If this does not match information in application, the application should be updated prior to approval.

7. What is the current effluent level achievable?				
Outfall Number(s) 004	Conc. (mg/L) 4.5	Method for calculation: <input checked="" type="radio"/> 30-day P99 <input type="radio"/> Other, specify:	Does this concur with application? <input type="radio"/> Yes <input checked="" type="radio"/> No, why not: Application used older dataset	DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.

8. What is the appropriate interim limitation(s) for the permit term?
 1.0 mg/L as a monthly average, pursuant to s. 283.16(6)(am) Wis. Stats.
 Facility upgrades will be needed to meet this limit (schedule required).
 Target Value = 0.2 mg/L
 Provide Rationale:
 Effluent total phosphorus data from the past three years (7/1/2020 - 6/30/2023, n=157) yields a 30-day P99 value of 4.5 mg/L. This value can be considered a level currently achievable. Facility upgrades and associated schedule will be required to meet the 1.0 mg/L interim limit.

Note: See description in Section 2.02 of the MDV implementation guidance. Interim limitations should reflect the "highest attainable condition" for the permittee in question pursuant to s. 283.16(7), Wis. Stat.

<p>9. <i>For Industries Only-</i> Where does the phosphorus in the effluent come from? (check all that apply)</p>	<p><input type="checkbox"/> Process <input type="checkbox"/> Additive Usage <input type="checkbox"/> Water supply</p> <p><i>Can intake credits be given or can the facility use an alternative water supply?</i></p> <p><input type="radio"/> Not feasible <input type="radio"/> Possibly, but further analysis needed <input type="radio"/> Not evaluated at this time</p>	<p><i>See Q14-15 & 19 on industrial form. If the answer is "possibly" or "not evaluated", the schedule section of the MDV permit should contain a requirement to perform this analysis.</i></p>
<p>10. Has this facility optimized?</p>	<p><input type="radio"/> Yes <input type="radio"/> In progress <input checked="" type="radio"/> No</p>	<p><i>See Q14 on municipal form & Q16 & 20 on industrial form. Facility must optimize and operate at an optimize treatment level (s. 283.16(6)(a), Wis. Stat.) If no will need compliance schedule.</i></p>
<p>11. Has a facility plan/compliance alternative plan been completed for the facility?</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> In progress <input type="radio"/> No</p>	<p><i>See Q15 on municipal form & Q17 on industrial form.</i></p>
<p>12. What is the projected cost for complying with phosphorus?</p> <p style="text-align: right;">Source:</p>	<p>\$ <u>886,000.00</u></p> <p>MDV Application and FCAP. See note below regarding compliance costs.</p>	<p><i>Facility must submit site-specific compliance costs. If cost projections are used from EIA, the permittee must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.</i></p>

Comments on planning efforts:

A final compliance alternatives plan was submitted in March of 2022 by MSA professional services on behalf of the Village of Fairwater. The Plan discusses solutions to the low-level phosphorus effluent limit including regionalization, land treatment, facility upgrades, and watershed-based alternatives. Regionalization, land treatment, and adaptive management are deemed not viable. Water quality trading may be viable in the future, but trading partners have not been identified at this time. Trading with chemical addition is touted as the selected final compliance option (for which a site-specific cost estimate is provided). If this were possible in the near term, the MDV could not be applied, as a major facility upgrade is not required. However, due to uncertainties around trading and chemical treatment ahead of the recirculating sand filter, this option is not currently viable. Therefore, compliance costs estimated for Fairwater as part of the 2015 EIA are used in the economic demonstration below.

<p>13. Are adaptive management and water quality trading viable?</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> Perhaps. Additional analysis required. <input type="radio"/> No</p>	<p><i>See Q18-21 on municipal form & Q22-25 on industrial form. If additional analyses required, the applicant may need to complete this analysis during the MDV permit term.</i></p>
<p>14. Has the point source met the appropriate primary screener?</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No. STOP- facility not eligible.</p>	<p><i>See Q4 of this form in addition to the "eligibility" guidance in Section 2.01 of the MDV Implementation Guidance.</i></p>

Comments on economic demonstration:

Compliance costs for Fairwater WWTF are shown at \$1,133,707 as capital costs and increased annual O&M costs of \$18,431. These assume that reactive sand filtration is required to achieve phosphorus limits. Assuming a 20-year 2.1% CWF loan on capital costs, annual payments total to \$69,729. With O&M, costs total to \$88,160. The residential portion (58%) results in \$51,132.80 borne by households. This cost, divided amongst 159 customer households, results in a \$321.59 annual average sewer user rate increase. Current rates are \$634 per year. Future rates would be \$955 per year, or 1.74% of the \$54,821.00 MHI. In Fond du Lac County, Sewer Rates at 1% MHI meet the primary screener. The applicant meets the primary screener.

15. What watershed option was selected?

- County project option. *Complete Section 5.*
- Binding, written agreement with the DNR to construct a project or implement a watershed plan. *Complete Section 4.*
- Binding, written agreement with another person that is approved by the DNR to construct a project or implement a watershed plan. *Complete Section 4.*

Section 4. Watershed Plan Review

16. MDV Plan Number:

Note: This is for tracking purposes. Contact Statewide Phosphorus Implementation Coordinator for the plan number.

17. Did the point source complete Form 3200-148?

- Yes
- No

18. Is the project area in the same HUC 8 watershed as the point of discharge?

- Yes
- No. *STOP- Watershed plan must be updated.*

19. What is the annual offset required?

See Section 2.03 of the MDV implementation guidance. If this value is different from the offset target provided in form 3200-148, the watershed plan should be amended.

20. Does the plan ensure that the annual load is offset annually?

- Yes
- No. *STOP- Watershed plan must be updated.*

21. Are projects occurring on land owned/operated by a CAFO or within a permitted MS4 boundary?

- Yes. *Work with appropriate DNR staff to ensure projects are not working towards other permit compliance.*
- No.

22. Are other funding sources being used as part of the MDV watershed project?

- Yes. *Work with appropriate DNR staff to ensure that funding sources can be appropriately used in the plan area.*
- No.

23. Do you have any concerns about the watershed project?

Note: Coordinate with other DNR staff as appropriate.

- Yes. *STOP- Watershed plan must be updated.*
- No.

Comments:

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is:

\$ 62.65

See "Payment Calculator" document at

[\\central\water\WQWT_PROJECTS\WY_CW_Phosphorus\MDV.](#)

Section 6. Determination

Based on the available information, the MDV application is:

- Approved
- Request for more information
- Denied

Save

Additional Justification (if needed):

Certification

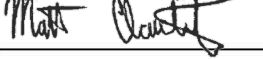
Preparer Name

Matt Claucherty

Title

Water Resources Management Specialist

Signature of Preparer



Date

7/24/2023

A copy of this completed checklist should be saved in SWAMP, and a notification of the decision should be sent to the Phosphorus Implementation Coordinator.

[Submit to Coordinator...](#)



7/24/2023

Mary Montag, President
PO Box 15
Fairwater, WI 53931

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Grand River in Fond du Lac County
Permittee: Village of Fairwater, WPDES WI-0021440

Dear Ms. Montag:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for in an application dated 5/18/2023. Wisconsin's multi-discharger phosphorus variance was approved by EPA on February 6, 2017. Coverage under the multi-discharger phosphorus variance may only be granted to an existing source that demonstrates a major facility upgrade is necessary to achieve phosphorus compliance and the upgrade will result in economic hardship as defined in the federally approved variance. The water quality criterion for which you are seeking a variance is contained in s. NR 102.06, Wis. Adm. Code.

After review of the application materials, the Department is tentatively approving coverage under the phosphorus multi discharger variance because the applicant has demonstrated that a major facility upgrade would be required to comply with the phosphorus water quality based effluent limitation, and the applicant meets the economic hardship eligibility criteria delineated in the federally approved variance. In addition, the permitted facility has agreed to comply with the interim limitations that will be included in the WPDES permit, and has agreed to reduce the amount of phosphorus entering surface waters by making payments to the counties pursuant to s. 283.16(6)(b)1., Wis. Stats.

Public comment on this decision will be solicited at the time of permit reissuance after which a final decision will be made. The Department appreciates your attention and interest in Wisconsin's multi-discharger phosphorus variance. Should you have further questions regarding this matter, please contact me at (608) 400 – 5596.

Sincerely,

Matt Claucherty, MDV Point Source Coordinator
Bureau of Water Quality

e-cc Gerald Lind, Fairwater Waterworks
Mark Stanek, WDNR
Sarah Adkins, WDNR
Tim Elkins, EPA Region 5
Micah Bennett, EPA Region 5