Permit Fact Sheet

General Information

Permit Number	WI-0028452-10-0
Permittee Name and Address	Wolf Treatment Plant Commission PO Box 452, Shawano, WI 54166
Permitted Facility Name and Address	Wolf Treatment Plant N4802 River Bend Road, Shawano, Wisconsin
Permit Term	July 01, 2026 to June 30, 2031
Discharge Location	South bank of the Wolf River, 0.75 miles downstream of the Highway M bridge
Receiving Water	Wolf River in Middle Wolf River Watershed of Wolf River River Basin in Shawano County
Stream Flow ($Q_{7,10}$)	310 cfs
Stream Classification	Warm Water Sport Fish (WWSF) Community, non-public water supply
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	2.63 MGD
Industrial or Commercial Contributors	Krueger International (Categorical) City of Shawano, Arrowcast Inc., Wisconsin Film and Bag
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory
Approved Pretreatment Program?	N/A

Facility Description

The Wolf Treatment Plant provides treatment for wastewaters generated in the City of Shawano, the Shawano Lake Sanitary District (SLSD), the Richmond Sanitary District, the Village of Bonduel, the Village of Cecil (through SLSD), and the Belle Plaine-Waukechon Utility District, all in east central Shawano County. The permittee's collection system consists of interceptor sewers that connect to its customers' collection systems, which are separate sanitary sewerage systems. Treatment consists of preliminary treatment of mechanical step screening and vortex hydraulic grit removal followed by secondary, biological treatment with anoxic/anaerobic selector basins followed by aeration basins and final clarifiers. Phosphorus removal is accomplished with biological nutrient removal supplemented by chemical precipitation using ferric chloride. Secondary effluent is disinfected on a seasonal basis (May – September) with sodium hypochlorite and dechlorinated with sodium bisulfite. Effluent is discharged on a continuous basis via Outfall 001 to the south bank of the Wolf River, approx. 0.75 mi downstream of the Highway M (Lieg Street) Bridge.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on September 16, 2025, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Brooke Klingbiel on September 29, 2025.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	1.98 MGD (2025)	INFLUENT: Representative samples shall be collected just after the step screen in the sampler room of the preliminary treatment building. Flow is measured with a Parshall flume and ultrasonic transducer.
111	N/A	FIELD BLANK: Sample point for reporting the analysis of field blanks collected using standard sample handling procedures for grab type effluent samples for Total Recoverable Mercury at sample point 001.
001	1.96 MGD (2025)	EFFLUENT: Representative samples shall be collected from the manhole prior to the chlorine contact tank. Samples for residual chlorine, fecal coliform, and Whole Effluent Toxicity shall be collected following the dechlorination process, when applicable. Flow is measured with a rectangular weir and an ultrasonic transducer at the outfall of chlorine contact chamber 1.
004	255 metric tons (2025)	LAND APPLICATION: Representative samples of the aerobically digested liquid that is stored in Storage Tank #2.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- 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	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Phosphorus, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Mercury, Total		ng/L	Quarterly	24-Hr Flow	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Recoverable				Prop Comp	

1.1.1 Changes from Previous Permit:

Influent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD5 and total suspended solids is required by s. NR 210.04(2), Wis. Adm. Code, to assess wastewater strengths and volumes and to demonstrate the percent removal requirements in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

2 Inplant - Monitoring and Limitations

2.1 Sample Point Number: 111- FIELD BLANK

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Quarterly	Blank	

2.1.1 Changes from Previous Permit:

In-plant limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

2.1.2 Explanation of Limits and Monitoring Requirements

Mercury Field Blank- Monitoring is included in the permit pursuant to s. NR 106.145, Wis. Adm. Code. Field blanks must meet the requirements under s. NR 106.145(9) and (10), Wis. Adm. Code. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). Field blanks are required to verify a sample has not been contaminated during collection, transportation or analysis.

3 Surface Water - Monitoring and Limitations

3.1 Sample Point Number: 001- 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	45 mg/L	5/Week	24-Hr Flow	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
				Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	760 lbs/day	5/Week	Calculated	
Suspended Solids, Total	Monthly Avg	580 lbs/day	5/Week	Calculated	
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 TMDL Calculations section in the permit.
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 TMDL Calculations section in the permit.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	
E. coli	Monthly Avg	126 #/100 ml	Weekly	Grab	Applies May through September, each year.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Applies May through September, each year. See the E. coli Percent Limit section in the permit. Enter the result in the DMR on the last day of the month.
Chlorine, Total Residual	Daily Max	38 ug/L	Daily	Grab	Applies May through September, each year.
Chlorine, Total	Weekly Avg	38 ug/L	Daily	Grab	Applies May through

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Residual					September, each year.
Chlorine, Total Residual	Monthly Avg	38 ug/L	Daily	Grab	Applies May through September, each year.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only in 2028.
Phosphorus, Total	Monthly Avg	1.0 mg/L	5/Week	24-Hr Flow Prop Comp	Existing concentration limits that are already in effect will be maintained to prevent backsliding.
Phosphorus, Total		lbs/day	5/Week	Calculated	Monitoring only upon permit effective date. Final TMDL-based mass limits go into effect per the phosphorus compliance schedule. See Phosphorus TMDL section in the permit.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See TMDL Calculations section in the permit.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL Calculations section in the permit.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Nitrogen.
Mercury, Total Recoverable		ng/L	Quarterly	Grab	
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET Section.
Chronic WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET Section.

3.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

- **Total Suspended Solids TMDL Limits:** Mass based TSS limits of 760 lbs/day as a weekly average and 580 lbs/day as a monthly average have been added to the permit to comply with requirements of the Upper Fox Wolf River TMDL. Effluent concentration (mg/L) shall be monitored and reported 5 times per week upon permit reissuance and will be used to calculate amounts reported for mass-based limits. An additional reporting requirement for lbs/month will be used to calculate the facility's 12-month rolling sum of total monthly discharge, which can be compared directly to the facility's designated WLA.
- **E. coli:** Fecal coliform monitoring and limits are replaced with Escherichia coli (E. coli) monitoring and limits.
- **Chloride**: Monthly monitoring in 2028 has been added to the permit to ensure sufficient sample results are available at the next permit reissuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.
- **Phosphorus TMDL Limits**- An interim limit of 1.0 mg/L goes into effect upon reissuance and will remain in effect unless a more stringent limit is required at a future permit issuance by ss. NR 217.13 and NR 217.16(2), Wis. Adm. Code, or the limit is relaxed following procedures outlined in ch. NR 207, Wis. Adm. Code. Discharge effluent concentration (mg/L) shall be reported 5 times per week upon permit reissuance and will be used to calculate amounts reported for mass-based parameters. An additional reporting requirement for lbs/month will be used to calculate the facility's 12-month rolling sum of total monthly discharge, which can be compared directly to the facility's designated WLA. Final TMDL WLA-based effluent limits of 4.1 lbs/day as a six-month average and 12 lbs/day as a monthly average will go into effect in accordance with Water Quality Based Effluent Limits for Total Phosphorus compliance schedule.
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N)**: Quarterly monitoring is required in specific quarters as outlined in the permit.

- **Mercury:** Removed the alternative effluent limit (AEL) for mercury due to the reasonable potential analysis; however, quarterly monitoring and pollutant minimization efforts are required to continue during the reissued permit term to maintain effluent quality at or below current levels.
- **PFAS:** Monitoring once every 2 months has been added to the permit in accordance with s. NR 108.98(2)(a), Wis. Adm. Code.

3.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated August 30, 2023.

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.

Expression of Limits- In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly and monthly average limits whenever practicable.

Upper Fox Wolf River Total Maximum Daily Load (TMDL): The permitted facility is located within the Upper Fox Wolf River Basin Total Maximum Daily Load (UFWRB TMDL), which was approved by EPA February 27, 2020. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amounts of phosphorus and total suspended solids that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from and comply with the applicable water quality criterion and are consistent with the assumptions and requirements of the EPA-approved WLAs in the TMDL, which are 1,366 lbs/yr for phosphorus and 155,662 lbs/yr for TSS for the permitted facility.

The approved TMDL expresses WLAs as lbs/year and lbs/day (maximum annual load divided by 365 days). As outlined in Section 4.6 of the department's 2020 TMDL Implementation Guidance for Wastewater Permits, TMDL limits must be given in the permit that are consistent with the TMDL WLA permit limits derived from the TMDL and need to be expressed as specified by 40 CFR 122.45 (d), s. NR 212.76 (4), and s. NR 205.065 (7),Wis. Adm. Code, unless determined to be impracticable. Impracticability has already been determined for phosphorus limits as laid out in the phosphorus impracticability agreement that was approved by USEPA in 2012 (see NPDES MOA Addendum dated July 12, 2012 at https://apps.dnr.wi.gov/swims/Documents/DownloadDocument?id=167886175).

For phosphorus, continuously discharging facilities covered by the UFWRB TMDL are given monthly average mass limits. If the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits (averaging period of May through October and November through April) are also included. The equivalent effluent concentration of 0.17 mg/L was calculated for the facility, thus, TMDL based mass limits are expressed as a six-month average and a monthly average equal to three times the six-month average limits.

For TSS, continuously discharging municipal/industrial facilities covered by the UFWRB TMDL are given monthly average and weekly average/daily max mass limits.

Facilities with UFWRB TMDL based effluent limits for phosphorus and TSS must report the 12-month rolling sum of total monthly discharge (lbs/yr). If reported 12-month rolling sums exceed the facility's max annual WLA, the facility's mass limits (monthly average and six-month average) may be recalculated using more appropriate CVs or monitoring frequencies when the permit is reissued to bring discharge levels into compliance with the facility's given WLA.

Mercury: In the pervious permit term(s) the permittee was granted a mercury variance. The currently available effluent data (November 2017 – June 2023 and July 2023 – November 2025) indicates that reasonable potential to exceed mercury limits has not been demonstrated. The effluent mercury sample of 6.9 ng/L (12/10/2024) is believed to be unrepresentative

of the discharge and was excluded from permit decisions. The permittee is required to continue the actions in the pollutant minimization plan to maintain effluent quality at or below current levels. This limit removal meets the antidegradation/antibacksliding requirements of ch. NR 207, Wis. Adm. Code, because mercury PMP efforts are recommended to continue in the reissued permit.

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for major municipal dischargers with an average flow rate greater than 1 MGD but less than 5 MGD, at a minimum sample effluent once every two-months for PFOS and PFOA pursuant s. NR 106.98(2)(b), Wis. Adm. Code.

A sample frequency of 1/2 months means one sample is taken during any two-month period. Examples of 1/2 month sample would be every other month (Jan, March, May, etc.) or back-to-back months with a break in between (February & March, May & June, Aug & Sept, etc.). DMR Short Forms will be generated for the following time periods: January-February, March-April, May-June, July-August, September-October, and November-December. At a minimum one sample result will be present on each form.

The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
004	B	Liquid	Fecal Coliform reduction	Injection or incorporation	Land Application	255
Does sludge management demonstrate compliance? Yes.						
Is additional sludge storage required? No.						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? Yes. If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? No.						

4.1 Sample Point Number: 004- LAND APPLICATION

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2027.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2027.
Radium 226 Dry Wt		pCi/g	Annual	Composite	
PFOA + PFOS		ug/kg	Annual	Calculated	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					based on updated DNR PFAS List. See PFAS Permit Sections for more information.

4.1.1 Changes from Previous Permit:

Sludge limitations and monitoring requirements were evaluated for this permit term, and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

PCB – Monitoring required once in 2027.

PFAS –Monitoring is required annually pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

4.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6), Wis. Adm. Code and in s. NR 204.07 (7), Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code. Radium requirements are addressed in s. NR 204.07(3)(n), Wis. Adm. Code.

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine future land application rates and released this risk assessment in January of 2025. The department is evaluating this new information. Until a decision is made, the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS" should be followed

Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department's implementation of EPA's recommendations. To quantitate this risk, PFAS sampling has been included in this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

5 Schedules

5.1 Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus

The permittee shall comply with the WQBELs for Phosphorus as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

Required Action	Due Date
Operational Evaluation Report: The permittee shall prepare and submit to the Department for approval an operational evaluation report. The report shall include an evaluation of collected effluent data, possible source reduction measures, operational improvements or other minor facility modifications that will optimize reductions in phosphorus discharges from the treatment plant during the period prior to complying with final phosphorus WQBELs and, where possible, enable compliance with final phosphorus WQBELs by July 1, 2029. The report shall provide a plan and schedule for implementation of the measures, improvements, and modifications as soon as possible, but not later than **July 1, 2029** and state whether the measures, improvements, and modifications will	07/01/2027

enable compliance with final phosphorus WQBELs. Regardless of whether they are expected to result in compliance, the permittee shall implement the measures, improvements, and modifications in accordance with the plan and schedule specified in the operational evaluation report. If the operational evaluation report concludes that the facility can achieve final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements, and minor facility modifications, the permittee shall comply with the final phosphorus WQBEL by **July 1, 2029** and is not required to comply with the milestones identified below for years 3 through 9 of this compliance schedule ('Preliminary Compliance Alternatives Plan', 'Final Compliance Alternatives Plan', 'Final Plans and Specifications', 'Treatment Plant Upgrade to Meet WQBELs', 'Complete Construction', 'Achieve Compliance'). STUDY OF FEASIBLE ALTERNATIVES - If the Operational Evaluation Report concludes that the permittee cannot achieve final phosphorus WQBELs with source reduction measures, operational improvements and other minor facility modifications, the permittee shall initiate a study of feasible alternatives for meeting final phosphorus WQBELs and comply with the remaining required actions of this schedule of compliance. If the Department disagrees with the conclusion of the report, and determines that the permittee can achieve final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements, and minor facility modifications, the Department may reopen and modify the permit to include an implementation schedule for achieving the final phosphorus WQBELs sooner than **July 1, 2035.**	
Compliance Alternatives, Source Reduction, Improvements and Modifications Status: The permittee shall submit a 'Compliance Alternatives, Source Reduction, Operational Improvements and Minor Facility Modification' status report to the Department. The report shall provide an update on the permittee's: (1) progress implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges and, to the extent that such measures, improvements, and modifications will not enable compliance with the WQBELs, (2) status evaluating feasible alternatives for meeting phosphorus WQBELs.	07/01/2028
Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment facility is necessary to achieve final phosphorus WQBELs, the submittal shall include a preliminary engineering design report. If the plan concludes Adaptive Management will be used, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 without the Adaptive Management Plan. If water quality trading will be undertaken, the plan must state that trading will be pursued.	07/01/2029
Final Compliance Alternatives Plan: The permittee shall submit a final compliance alternatives plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment is necessary to meet final phosphorus WQBELs, the submittal shall include a final engineering design report addressing the treatment plant upgrades, and a facility plan if required pursuant to ch. NR 110, Wis. Adm. Code. If the plan concludes Adaptive Management will be implemented, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 and an engineering report addressing any treatment system upgrades necessary to meet interim limits pursuant to s. NR 217.18, Wis. Adm. Code. If the plan concludes water quality trading will be used, the submittal shall identify potential trading partners.	07/01/2030

Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/01/2031
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Adaptive Management or Water Quality Trading measures or to include a revised schedule based on factors in s. NR 217.17, Wis. Adm. Code, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with final phosphorus WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance are subject to s. 283.53(2), Stats.) Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/01/2032
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	10/01/2032
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	10/01/2033
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	10/01/2034
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	06/30/2035
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	07/01/2035

5.1.1 Explanation of Schedule

Subchapter NR 217.17, Wis. Adm. Code, allows the department to provide a schedule of compliance for water quality-based phosphorus limits where the permittee cannot immediately achieve compliance. This compliance schedule requires the permittee to comply with the final water quality-based phosphorus limits within 5 years.

The permittee may be required to meet the final phosphorus WQBEL sooner than March 31, 2031 (less than 5 years) if the required "Operational Evaluation Report" concludes that the phosphorus WQBEL can be met using the existing treatment system with only source reduction measures, operational improvements and minor facility modifications. Also, the permittee will conduct a "Study of Feasible Alternatives" to determine whether Water Quality Trading or Adaptive Management, either alone or in combination with plant upgrades will allow the plant to meet the phosphorus WQBEL.

The department believes that the compliance schedule suggested in the draft permit provides the appropriate length of time for the permittee to evaluate these options, implement the chosen option and meet the final phosphorus limits (WQBELs).

5.2 Mercury Pollutant Minimization Program

As a condition of the variance to the water quality based effluent limitation(s) for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Final Mercury Report: Submit a report summarizing the mercury pollutant minimization measures implemented during the current permit term and the success in maintaining effluent quality at or below the current concentrations. The report shall include an analysis of trends in quarterly and annual average mercury concentrations and total mass discharge of mercury based on mercury sampling and flow data covering the current permit term. The report shall also include an analysis of how influent and effluent mercury varies with time and with significant loadings of mercury such as loads from industries or collection system maintenance.	12/31/2030

5.2.1 Explanation of Schedule

The permittee is required to continue pollutant minimization measures to maintain effluent quality at or below current levels. This schedule requires a report documenting the continued measures.

5.3 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	07/01/2027
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued.	07/01/2028

If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	

5.3.1 Explanation of Schedule

As stated above, ch. NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Section 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.

5.4 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan Submittal: Submit an update to the 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.	07/01/2028

5.4.1 Explanation of Schedule

An up-to-date Land Application Management plan is a standard requirement in reissued industrial permits per s. NR 214.17(6)(c), Wis. Adm. Code.

Attachments

Water Quality Based Effluent Limitations for the Wolf Treatment Plant Commission WPDES Permit No. WI-0028452-10-0, by Michael Polkinghorn, dated August 30, 2023

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Ashley Clark, Wastewater Specialist

Date: April 29, 2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: August 30, 2023

TO: Sarah Adkins – NER/Oshkosh Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center

SUBJECT: Water Quality-Based Effluent Limitations for the Wolf Treatment Plant Commission
WPDES Permit No. WI-0028452-10-0

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 the Wolf Treatment Plant Commission in Shawano County. This municipal wastewater treatment facility (WWTF) discharges to the Wolf River, located in the Middle Wolf River Watershed in the Wolf River Basin. This discharge is included in the Upper Fox/Wolf Rivers Basin (UFWRB) Total Maximum Daily Load (TMDL) as approved by EPA on 02/27/2020. 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 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5			45 mg/L	30 mg/L		1, 2
TSS			45 mg/L 760 lbs/day	30 mg/L 580 lbs/day		2, 3
pH	9.0 s.u.	6.0 s.u.				1, 2
E. coli				126 #/100 mL geometric mean		4
Residual Chlorine	38 µg/L		**38 µg/L**	**38 µg/L**		1, 5
Phosphorus						3
Interim				1.0 mg/L		
Final				12 lbs/day	4.1 lbs/day	
PFOS and PFOA						6
Mercury (Total Recoverable)						7
Chloride						8
TKN, Nitrate+Nitrite, and Total Nitrogen						9
Acute WET						1, 10, 12
Chronic WET						1, 11, 12

Footnotes:

1. No changes from the current permit.
2. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.

3. The total suspended solids (TSS) and phosphorus mass limits are based on the TMDL for the UFWRB to address TSS and phosphorus water quality impairments within the TMDL area. The monthly average limit of 1.0 mg/L, which is also a technology-based effluent limit as described in s. NR 217.04(1), Wis. Adm. Code, will serve as an interim limit during the phosphorus compliance schedule.
4. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. 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.
6. Monitoring at a frequency of once every 2 months is required in accordance with s. NR 106.98(2), Wis. Adm. Code.
7. The reissued permit should include a requirement to continue PMP efforts and maintain effluent quality at or below current levels along with continued mercury monitoring.
8. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
9. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all major municipal permittees. Total nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).
10. Annual acute whole effluent toxicity (WET) testing is required during the reissued permit term. 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.
11. Annual chronic WET testing is required during the reissued permit term. The Instream Waste Concentration (IWC) to assess chronic test results is 5%. 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%, 30%, 10%, 3% & 1% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the Wolf River upstream of the confluence of Outfall 001.
12. 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).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, discharge area map, & temperature limit calculations.

PREPARED BY: Michael A. Polkinghorn, E.I.T. – Water Resources Engineer

E-cc: Roy Van Gheem, P.E., Wastewater Engineer – NER/Green Bay Service Center
Heidi Schmitt-Marquez, Regional Wastewater Supervisor – NER/Green Bay Service Center
Diane Figiel, P.E., Water Resources Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Wolf Treatment Plant Commission

WPDES Permit No. WI-0028452-10-0

Prepared by: Michael A. Polkinghorn, E.I.T.

PART 1 – BACKGROUND INFORMATION

Facility Description

The Wolf Treatment Plant provides treatment for wastewaters generated in the City of Shawano, the Shawano Lake Sanitary District (SLSD), the Richmond Sanitary District, the Village of Bonduel, the Village of Cecil (through SLSD), and the Belle Plaine-Waukechon Utility District, all in east central Shawano County. The permittee's collection system consists of interceptor sewers that connect to its customers' collection systems, which are separate sanitary sewerage systems. Treatment consists of preliminary treatment of mechanical step screening and vortex hydraulic grit removal followed by secondary, biological treatment with anoxic/anaerobic selector basins followed by aeration basins and final clarifiers. Phosphorus removal is accomplished with biological nutrient removal supplemented by chemical precipitation using ferric chloride. Secondary effluent is disinfected on a seasonal basis (May – September) with sodium hypochlorite and dechlorinated with sodium bisulfite. Effluent is discharged on a continuous basis via Outfall 001 to the south bank of the Wolf River, approx. 0.75 mi downstream of the Highway M (Lieg Street) Bridge.

Attachment #2 is a discharge area map of Outfall 001.

Existing Permit Limitations

The current permit, expiring on 09/30/2022, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					
BOD_5			45 mg/L	30 mg/L	1, 2
TSS			45 mg/L	30 mg/L	1, 2
pH	9.0 s.u.	6.0 s.u.			1, 2
Fecal Coliform May – September			**656#/100 mL geometric mean**	400#/100 mL geometric mean	3
Residual Chlorine	38 µg/L		**38 µg/L**	**38 µg/L**	3
Phosphorus				1.0 mg/L	4
Mercury				3.9 ng/L	5
Ammonia Nitrogen					6
Acute WET					7
Chronic WET					7

Footnotes:

1. 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.
2. These limits are based on the Warm Water Sport Fish (WWSF) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. 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.
4. This limit is a technology-based effluent limit as described in s. NR 217.04(1), Wis. Adm. Code.
5. The interim limit is an alternative mercury effluent limit based on the variance granted by EPA as described in s. NR 106.145(4), Wis. Adm. Code, for the current permit term. This limit is based on the 1-day P_{99} of effluent data and includes implementation of a pollutant minimization plan.
6. Monitoring only.
7. Annual acute and chronic whole effluent toxicity (WET) testing was required during the current permit term. The IWC for chronic WET was 5%.

Receiving Water Information

- Name: Wolf River
- Waterbody Identification Code (WBIC): 241300
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. 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-Q_{10} value is from the USGS Station at Keshena WI, approx. 10.2 mi upstream of Outfall 001. The 7-Q_2 values was estimated based on the ratio of 7-Q_2 to 7-Q_{10} low flows from the Wolf River at USGS Station W8 or SE ¼ of Section 12, T22N – R14E, at the Pearl St. Bridge in New London, WI.

  7-Q_{10} = 310 cubic feet per second (cfs)
  7-Q_2 = 453 cfs
  90-Q_{10} = 385 cfs
  Harmonic Mean Flow = 596 cfs

  The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
- Hardness = 140 mg/L as $CaCO_3$. This value represents the geometric mean of data (n = 5, September 2018 – March 2022) from WET testing.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Source of background concentration data: Background data for substances came from multiple sources listed below:
  - Mercury: Little Rapids Corp Shawano Paper Mill Sample Point 601 Intake Water Mercury Testing (June 2018 – April 2023).
  - Remaining substances: Wolf River at New London WI. This location is approx. 42 mi downstream of Outfall 001 so the assimilative capacity of the various substances in the Wolf River upstream of Outfall 001 is expected to be greater than estimated.
  - All numerical values are shown in the tables in Part 2 below in the columns titled “Mean

Background". If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen is described later in this evaluation.

- Multiple dischargers: The Little Rapids Corp Shawano Paper Mill discharges process wastewater effluent approx. 0.4 mi upstream of Outfall 001. The limit evaluation for the paper mill does not consider the Wolf TPC for multiple discharge-based limits due to the amount of dilution available. The previous limit evaluation for the Wolf TPC (November 2015) had considered multiple discharge-based limits for phosphorus, but no other constituents of concern. Both facilities now have specific wasteload allocations to control the phosphorus discharged. Therefore, other dischargers will not be considered further in this evaluation.
- Impaired water status: The Wolf River was on the Clean Water Act Section 303(d) list for mercury and polychlorinated biphenyls (stream mi 90.98 – 110.69) but has been delisted. The Wolf River is included the UFWRB TMDL area to address TSS and phosphorus impairments in the TMDL area.

Effluent Information

- Design flow rate(s):
  Annual average = 2.63 million gallons per day (MGD)
  For reference, the actual average flow from October 2017 – June 2023 was 2.27 MGD.
- Hardness = 300 mg/L as $CaCO_3$. This value represents the geometric mean of data (n = 4, February 2022) from the permit application.
- 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 3 industrial contributors. Water supply from Shawano Public Works, Shawano Lake Sanitary District, and the Village of Bonduel.
- Total Phosphorus Wasteload Allocation: 1,366 lbs/year, 3.7 lbs/day (See page 11 of Appendix H of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids Upper Fox and Wolf Basins Report, February 27, 2020*).
- Total Suspended Solids Wasteload Allocation: 155,662 lbs/year, 426 lbs/day (See page 11 of Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids Upper Fox and Wolf Basins Report, February 27, 2020*).
- Additives: Sodium hypochlorite, sodium bisulfite, and ferric chloride.
- Effluent characterization: This facility is categorized as a major municipal facility, so the permit application required effluent sample analyses for all the "priority pollutants" except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The current permit required ammonia nitrogen monitoring.
- Effluent data for detectable 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.
- Mercury field blanks from Sample Point 111 were used to evaluate if contamination was present from either sample transportation or environmental sources for the respective effluent mercury sample. In this case all the field blanks were nondetectable, so no effluent mercury samples were excluded from this evaluation due to these concerns.
- Dibenzo(a,h)-anthracene was detected in Outfall 001 at 0.057 µg/L (02/16/2022). Currently there are neither promulgated WQC nor secondary values available for this substance so limits cannot be evaluated at this time.

Attachment #1

Chloride & Copper Effluent Data

Sample Date	Copper (µg/L)	Chloride (mg/L)
02/16/2022	6.1	210
02/20/2022	4.2	200
02/24/2022	5.1	220
02/28/2022	4.6	220
03/04/2022	4.6	
03/08/2022	4.5	
03/12/2022	5.1	
03/16/2022	12	
03/20/2022	5.2	
03/24/2022	4.0	
03/28/2022	4.7	
Mean		213
1-day P_{99}	13	
4-day P_{99}	8.6	

Mercury Effluent Data

Sample Date	Conc. (ng/L)	Sample Date	Conc. (ng/L)	Sample Date	Conc. (ng/L)
11/30/2017	1.6	12/06/2019	0.69	12/07/2021	1.6
03/19/2018	1.3	03/18/2020	1.3	03/17/2022	1.1
06/11/2018	0.76	06/16/2020	0.79	06/15/2022	0.87
09/17/2018	0.98	09/15/2020	0.73	09/14/2022	0.51
12/11/2018	1.3	12/10/2020	0.67	11/29/2022	0.60
03/13/2019	1.4	03/23/2021	0.81	03/16/2023	0.91
06/18/2019	1.4	06/22/2021	1.1	06/12/2023	0.74
09/18/2019	1.0	09/16/2021	0.74		
1-day P_{99} = 2.0 ng/L					
4-day P_{99} = 1.4 ng/L					
30-day P_{99} = 1.1 ng/L					

The following table presents the average concentrations and loadings at Outfall 001 from October 2017 – June 2023 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*
BOD_5	6.7 mg/L
TSS	5.3 mg/L
pH field	7.4 s.u.
Fecal Coliform	107 #/100 mL
Chlorine	<100 µg/L
Phosphorus	0.54 mg/L

Mercury	1.0 ng/L

*Any 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 P_{99}) 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-Q_{10}

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. 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-Q_{10} 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.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

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

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

Qe = 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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Wolf TPC and the limits are set based on two times the ATC.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 248 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

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.
Chlorine		19.0	38.1				
Chromium (+6)		16.0	32.0	6.4	3.4		3.4
Copper	300	43.7	87.5			13	12
Mercury (ng/L)		830	1,660			2.0	1.6
Nickel	268	1,080	2,161	432	1.6		1.6
Zinc	300	315	629	126	31		31
Chloride (mg/L)		757	1,514	303	213		220
Pyrene**		140	140	28	0.017		0.017

* 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.

** The limit for this substance is based on a secondary value. Acute limits are set equal to the secondary value rather than two times or using the 1-Q_{10} s. NR 106.06(3)(b)2 and s. NR 105.05(2)(f)6), Wis. Adm Code.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 77.5 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD. mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.28		146			
Chromium (+6)		10.98		220	44	3.4	
Copper	140	13.79	1.06	256			8.6
Mercury (ng/L)		440	1.5	440			1.4
Nickel	140	69.30		1,389	278	1.6	
Zinc	140	161.37	1.8	3,200	640	31	
Chloride (mg/L)		395	13.0	7,670	1,534	213	
Pyrene*		7.78		7.78	1.56	0.017	

* The limit for this substance is based on a secondary value.

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 96.3 cfs (¼ of the 90-Q_{10}), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	30-day P_{99}
Mercury (ng/L)	1.3	1.5	1.3	1.1

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 149 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Antimony	373		14,031	2,806	0.38	
Chromium (+6)	7,636		287,232	57,446	3.4	
Mercury (ng/L)	1.5	1.5	1.5			1.1
Nickel	43,000		1,617,465	323,493	1.6	

Monthly Average Limits based on Human Cancer Criteria (HCC)

There are no substances detected in the effluent for which HCC exist. 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 chlorine. Limits and/or monitoring recommendations are provided in the paragraphs below:

Total Residual Chlorine – Because chlorine is added as a disinfectant, effluent limitations are recommended to assure proper operation of the de-chlorination system. Section NR 210.06(2)(b), Wis. Adm. Code, states, "When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L." Because the WQBELs are more restrictive, they are recommended instead. **Specifically, a daily maximum limit of 38 µg/L is required.** Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required.

The current permit has the weekly average and monthly average chlorine limits of 38 µg/L to satisfy the expression of limits requirements as described in ss. NR 106.07, and NR 205.065(7), Wis. Adm. Codes. **These are required to be retained during the reissued permit term.**

Chloride **–** Considering available effluent data from the current permit term (February 2022 – March 2022), the mean effluent concentration of effluent data is 213 mg/L with a 1-day maximum of 220 mg/L. **These effluent concentrations are below the calculated WQBELs for chloride; therefore no effluent limits are needed. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

Mercury – Considering available effluent data from the current permit term (November 2017 – June 2023), the 1-day, 4-day, and 30-day P_{99} values are 2.0, 1.4, and 1.1 ng/L respectively. **These are below the calculated WQBELs for mercury; therefore, no effluent limits are needed. The permit should include a requirement to continue PMP efforts and maintain effluent quality at or below current levels along with continued mercury monitoring.**

The current permit includes a mercury variance with an alternative effluent limit of 3.9 ng/L as a monthly average. Antidegradation requirements as described in subch. 1of ch. NR 207, Wis. Adm. Code, are not applicable for limit removal as it is not considered an increased or new discharge due to the continuation of PMP efforts in the reissued permit. Antidegradation requirements are met for an interim limit removal

as described in s. NR 207.12, Wis. Adm. Code, due to PMP efforts made in the current permit term resulting in effluent quality meeting the mercury WQS in the Wolf River. **Therefore, the monthly average interim limit of 3.9 ng/L is recommended to be removed during the reissued permit term.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of discharge and the effluent flow rate, **PFOS and PFOA monitoring is recommended at a once every two months frequency.**

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. Given the fact that the Wolf TPC does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time. The table below shows the results of effluent ammonia nitrogen sampling at Outfall 001 during October 2017 – June 2023:

Ammonia Nitrogen Effluent Data

Statistic	Conc. (mg/L)
1-day P_{99}	0.23
4-day P_{99}	0.15
30-day P_{99}	0.10
Mean*	0.080
Std	0.045
Sample size	69
Range	<0.039 - 0.36

Based on this effluent data, there is no reasonable potential for the discharge to exceed the most stringent ammonia nitrogen limits that would be calculated. **Therefore, ammonia nitrogen limits are not recommended during the reissued permit term. Monthly monitoring is recommended to continue during the reissued permit term to determine the need of ammonia nitrogen limits at the next permit issuance.**

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

On May 1, 2020, revisions to chs. NR 102 and NR 210, Wis. Adm. Codes, became effective which replace fecal coliform limits with new *Escherichia coli* (*E. coli*) limits for protection of recreational uses. Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

1. The geometric mean of *E. coli* bacteria in effluent samples collected in any calendar month may not exceed 126 counts/100 mL.
2. No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 counts/100 mL.

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because the Wolf TPC's permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

These limits are required during May – September. No changes are recommended to the current recreational period and the required disinfection season.

Effluent Data
The Wolf TPC has monitored effluent *E. coli* from May 2021 – September 2021 and a total of 21 results are available. A geometric mean of 126 counts/100 mL was exceeded once out of 5 months, with a maximum monthly geometric mean of 141 counts/100 mL (September 2021). Effluent data has exceeded 410 counts/100 mL once (which is 5% of the total sample results). The maximum reported value was 727 counts/100 mL (09/24/2021). **Based on this effluent data it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.**

PART 5 – PHOSPHORUS & TSS

Technology-Based Effluent Limit – Phosphorus
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 Wolf TPC currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit.** This limit remains applicable unless a more stringent WQBEL is given. 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 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 (UFWRB TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). For the Wolf TPC, these phosphorus WLAs are 1,366 lbs/yr and 3.7 lbs/day.

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 UFWRB 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:

$$\text{TP Equivalent Effluent Concentration} = \text{WLA} \div (365 \text{ days/yr} * \text{Flow Rate} * \text{Conversion Factor})$$
$$= 1{,}366 \text{ lbs/yr} \div (365 \text{ days/yr} * 2.63 \text{ MGD} * 8.34)$$
$$= 0.17 \text{ mg/L}$$

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.

TP 6-Month Average Permit Limit = WLA ÷ 365 days/yr * multiplier
= (1,366 lbs/yr ÷ 365 days/yr) * 1.09
= 4.1 lbs/day

TP Monthly Average Permit Limit = TP 6-Month Average Permit Limit * 3
= 4.1 lbs/day * 3
= 12 lbs/day

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 0.21. 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 5x/wk; if a different monitoring frequency is used, the stated limits should be reevaluated.

The 6-month average and monthly average mass limits of 4.1 and 12 lbs/day respectively are recommended during the reissued permit term for Outfall 001 rounding to 2 significant figures. The limits are equivalent to the concentrations of 0.19 and 0.56 mg/L respectively at an effluent flow of 2.63 MGD.

The UFWRB 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.

Interim Limit – Phosphorus
Effluent phosphorus concentration was sampled during October 2017 – June 2023. Mass effluent data is calculated using the concentration data and the actual effluent flow that occurred on the same day.

Phosphorus Effluent Data

Statistics	Conc. (mg/L)	Mass Discharge (lbs/day)
1-day P_{99}	1.26	25
4-day P_{99}	0.85	17
30-day P_{99}	0.64	12
Mean	0.54	10
Std	0.23	4.5
Sample Size	1,499	1,499
Data Range	0.1 – 3.93	1.6 – 61

Attachment #1

Date Range	October 2017 – June 2023

A comparison of the calculated monthly average and 6-month average mass-based effluent phosphorus data with the phosphorus TMDL limits shows the Wolf TPC cannot currently meet the limits. Therefore, a compliance schedule and an interim limit are needed in the permit to meet the phosphorus TMDL limits. This limit should reflect a value which the facility is able to currently meet; however, it should also consider the receiving water quality, keeping the water from further impairment. **It is recommended that the interim limit be set equal to 1.0 mg/L as a monthly average,** equal to the technology-based effluent limit in the current permit. This value is recommended to allow for operational flexibility when the facility continues phosphorus treatment optimization activities, which often consist of trial and error.

TMDL Limits – TSS

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 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). For the Wolf TPC, these TSS WLAs are 155,662 lbs/yr and 426 lbs/day.

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.

The Wolf TPC is a municipal facility and is therefore subject to weekly average and monthly average TSS limits derived from TSS annual WLAs.

TSS Weekly Average Permit Limit = Daily WLA * Weekly multiplier
= 426 lbs/day * 1.78
= 759 lbs/day

TSS Monthly Average Permit Limit = Daily WLA * Monthly multiplier
= 426 lbs/day * 1.35
= 576 lbs/day

The multipliers used in the weekly average and monthly average calculation were determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 0.62. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived phosphorus permit limits will also reduce effluent variability with respect to TSS. Thus, the maximum anticipated coefficient of variation expected by any facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies TSS monitoring as 5x/wk; if a different monitoring frequency is used, the stated limits should be reevaluated.

The weekly average and monthly average mass limits of 760 and 580 lbs/day respectively are recommended during the reissued permit term for Outfall 001, rounding to 2 significant figures. The limits are equivalent to the concentrations of 35 and 26 mg/L respectively at an effluent flow of 2.63

MGD. **These TMDL-based mass effluent limitations should be included in the permit along with the currently imposed TSS concentration limits.**

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 TSS concentration was sampled during October 2017 – June 2023. Mass effluent data is calculated using the concentration data and the actual effluent flow that occurred on the same day.

TSS Effluent Data

Statistics	Conc. (mg/L)	Mass Discharge (lbs/day)
1-day P_{99}	14	331
4-day P_{99}	9	201
30-day P_{99}	7	133
Mean	5	102
Std	3	64.2
Sample Size	2,096	2,096
Data Range	<2 – 35	0 – 1,328
Date Range	October 2017 – June 2023	

A comparison of both concentration and mass-based effluent TSS P_{99} statistics with the equivalent concentration and mass-based TSS TMDL limits shows the Wolf TPC currently can meet those limits. **Therefore, a compliance schedule and an interim limit are not needed in the permit to meet the TSS TMDL limits.**

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 chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from October 2017 – June 2023.

The lowest calculated temperature WQBEL is 120 ºF as a daily maximum. The complete temperature limit calculations are included as attachment #3. At temperatures above approximately 103° F, conventional biological treatment systems do not function properly and experience upsets. There is no indication that this has ever occurred in this treatment system, so there is no reasonable potential for the

discharge to exceed this limit. **Therefore, temperature limit or monitoring are not recommended during the reissued permit term.**

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 (2022)*.

- 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 LC_{50} (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 IC_{25} (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 5% 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:

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

Where:

Q_e = annual average flow = 2.63 MGD = 4.07 cfs.
f = fraction of the Q_e withdrawn from the receiving water = 0.
Q_s = ¼ of the 7-Q_{10} = 310 cfs ÷ 4 = 77.5 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 001 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.

- Shown below is a tabulation of all available WET data for Outfall 001. 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. Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005. Therefore, only WET tests conducted June 2005 to present are shown in the table below:

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Pass or Fail?	Use in RP?	
08/15/2006	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
11/13/2007	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
06/17/2008	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
02/24/2009	>100	>100	Pass	No	>100	>100	Pass	No	1
09/13/2011	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
06/19/2012	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
03/04/2013	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
12/09/2014	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
07/14/2015	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
06/07/2016	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
08/08/2017	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
09/11/2018	>100	>100	Pass	Yes	36.1	>100	Pass	Yes	
10/29/2019	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
07/28/2020	>100	>100	Pass	Yes	61.7	>100	Pass	Yes	
05/18/2021	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
03/08/2022	>100	>100	Pass	Yes	>100	21.8	Pass	Yes	
05/09/2023	>100	>100	Pass	Yes	>100	>100	Pass	Yes	

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.

- 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.

  Acute Reasonable Potential = [(TUa effluent) (B)(AMZ)]

  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 LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

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

Chronic Reasonable Potential = [(TU_c effluent) (B)(IWC)]

Chronic WET Limit Parameters

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/21.8 = 4.59	3.0 Based on 3 detects	5%

[(TUc effluent) (B)(IWC)] = 0.69 < 1.0

Therefore, reasonable potential is not shown for a chronic WET limit using the procedures in s. NR 106.08(6) and representative data from August 2006 – March 2022.

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 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.

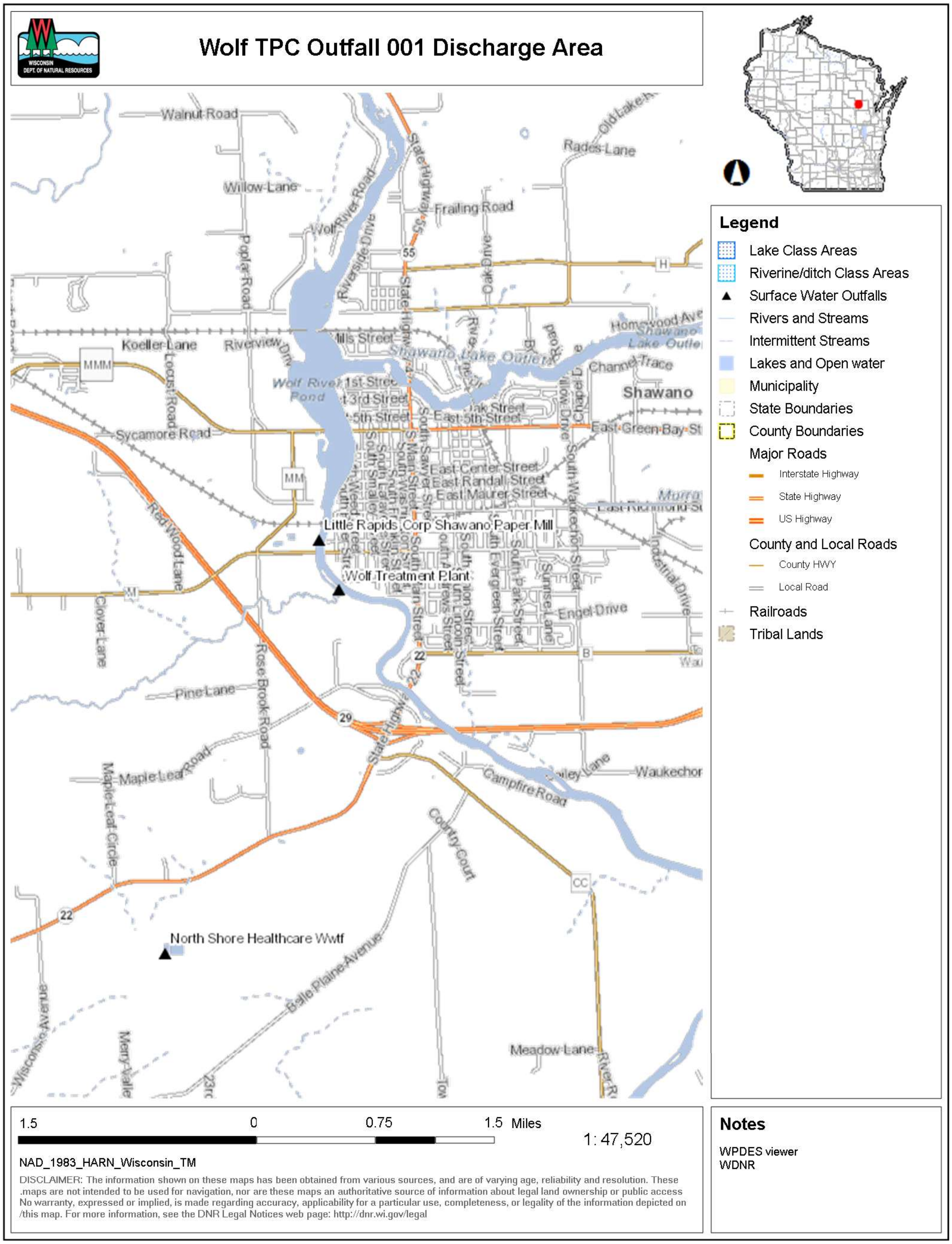
WET Checklist Summary

	Acute	**Chronic**
AMZ/IWC	Not applicable. **0 Points**	IWC = 5%. **0 Points**
Historical Data	Sixteen tests used to calculate RP. No tests failed. **0 Points**	Sixteen 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	WWSF community. **5 Points**	Same as acute. **5 Points**
Chemical-Specific Data	No reasonable potential for limits based on ATC; multiple substances detected. Additional Compounds of Concern: Antimony and pyrene. **5 Points**	No reasonable potential for limits based on CTC; multiple substances detected. Additional Compounds of Concern: Antimony and pyrene. **5 Points**
Additives	One biocides and 2 water quality conditioners added. Permittee has proper P chemical SOPs in place: No. **20 Points**	All additives used more than once per 4 days. **20 Points**
Discharge Category	Three industrial contributors. **7 Points**	Same as acute. **7 Points**

Attachment #1

	Acute	Chronic
Wastewater Treatment	Secondary or better. **0 Points**	Same as acute. **0 Points**
Downstream Impacts	No impacts known. **0 Points**	Same as acute. **0 Points**
Total Checklist Points:	**37 Points**	**37 Points**
Recommended Monitoring Frequency (from Checklist):	Annual acute tests recommended.	Annual chronic tests recommended.
Limit Required?	No.	No.
TRE Recommended? (from Checklist)	No.	No.

- **A minimum of annual acute and chronic monitoring is recommended because the Wolf TPC is a major municipal discharger with a design flow greater than 1.0 MGD.** Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application. 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).


Wolf TPC Outfall 001 Discharge Area
Legend
Lake Class Areas
Riverine/ditch Class Areas
Surface Water Outfalls
Rivers and Streams
Intermittent Streams
Lakes and Open water
Municipality
State Boundaries
County Boundaries
Major Roads
Interstate Highway
State Highway
US Highway
County and Local Roads
County HWY
Local Road
Railroads
Tribal Lands
Little Rapids Corp Shawano Paper Mill
Wolf Treatment Plant
North Shore Healthcare Wwtf
Shawano
Wolf River Pond
Shawano Lake Outlet
1.5 0 0.75 1.5 Miles
1: 47,520
NAD_1983_HARN_Wisconsin_TM
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These .maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on /this map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal
Notes
WPDES viewer
WDNR

Attachment #3

Temperature Limits for Receiving Waters with Unidirectional Flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Wolf TPC		**7-Q_{10}:**	310	cfs		
Outfall(s):	001		**Dilution:**	25%		**Start:** NA	10/01/17
Date Prepared:	8/7/2023		**f:**	0		**End:** NA	06/30/23
Design Flow (Qe):	2.63	MGD	**Stream type:**	Large warm water sport or forage fish co			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	19.0	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	310	3.142	3.330	0			NA	120
FEB	33	50	76	310	2.547	2.644	0			NA	120
MAR	36	52	76	310	3.770	4.574	0			NA	120
APR	46	55	79	310	3.977	4.324	0			NA	120
MAY	60	65	82	310	3.545	4.363	0			NA	120
JUN	71	75	85	310	3.086	3.751	0			NA	120
JUL	75	80	86	310	2.977	3.354	0			NA	120
AUG	74	79	86	310	2.836	3.054	0			NA	120
SEP	65	72	84	310	3.653	4.116	0			NA	120
OCT	52	61	80	310	3.758	4.098	0			NA	120
NOV	39	50	77	310	2.824	3.261	0			NA	120
DEC	33	49	76	310	3.104	4.306	0			NA	120