Permit Fact Sheet

General Information

Permit Number:	WI-0022471-11-0	
Permittee Name:	Waldo Wastewater Utility	
Address:	4 Second Street, PO Box 6	
City/State/Zip:	Waldo WI 53093	
Discharge Location:	North bank of the Onion River, approximately 200 feet south of the wastewater treatment plant, located at 4 Second Street, Waldo, WI (Lat: 43.67555°N Long: -87.93729°W)	
Receiving Water:	Onion River (Onion River Watershed, Sheboygan River Basin) in Sheboygan County	
StreamFlow ($Q_{7,10}$):	6.7 cfs	
Stream Classification:	Warm water sport fish community; non-public water supply	
Design Flow(s)	Daily Maximum	0.191 MGD
	Weekly Maximum	0.160 MGD
	Monthly Maximum	0.120 MGD
	Annual Average	0.087 MGD
Significant Industrial Loading?	No	
Operator at Proper Grade?	Yes. Bruce Neerhof the OIC is certified in all plant subclasses. Waldo is a basic facility in subclasses A3, B, C, D, P, and SS.	
Approved Pretreatment Program?	N/A	

Facility Description

The Village of Waldo operates a recirculating sand filter WWTP that serves approximately 490 residents with no industrial contributors. The WWTP consists of an influent pumping station, a rotary fine screen, a splitter box that directs wastewater to two trains of three septic tanks, and eight sand filter beds comprised of different grades of stone. Effluent is disinfected via UV disinfection prior to discharge to the Onion River. Septic tank solids are hauled to another facility for treatment.

Substantial Compliance Determination

Enforcement During Last Permit: No enforcement actions were taken during the current permit term. The facility experienced 4 total phosphorus monthly average limit violations in 2022 and an additional 4 in 2023. The problem was addressed by more frequent cleaning of septic tanks and restarting the chemical feed system in the fall 2023. These were minor exceedances and pre-enforcement contact was made with the facility to take corrective actions in the fall of 2022 and 2023. The facility has since returned to consistent compliance.

After a desk top review of all discharge monitoring reports, CMARs, compliance schedule items, and a site visit on July 24, 2023, this facility has been found to be in substantial compliance with their current permit.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701	Flow 0.05 MGD; TSS 235.9 mg/L; BOD_5 303.48 mg/L (all January 2019 through June 2023 avg)	INFLUENT: 24-hour flow proportional samples shall be collected from the influent pumping station wet well.
001	Flow N/A; TSS 6.31 mg/L; BOD_5 7.29 mg/L (all January 2019 through June 2023 avg)	EFFLUENT: 24-hour flow proportional composite samples shall be collected from the UV channel prior to disinfection. Grab samples shall be collected from the UV channel after disinfection.
901	N/A	Solids from septic tank are hauled by a licensed septage hauler to another facility for treatment.

1 Influent - Proposed Monitoring

1.1 Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Suspended Solids, Total		mg/L	2/Week	24-Hr Flow Prop Comp	
BOD_5, Total		mg/L	2/Week	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit:

Influent monitoring requirements were re-evaluated for the proposed permit term and no changes were made from the previous permit.

1.1.2 Explanation of Limits and Monitoring Requirements

- **BOD_5 and Total Suspended Solids:** Tracking of BOD_5 and total suspended solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code and in the Standard Requirements section of the permit. Taking into consideration guidance and requirements in administrative code, influent monitoring frequencies for the Village of Waldo's permit were determined to be appropriate for pollutants that have final effluent limits in effect during this permit term.

2 Surface Water - Proposed Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD_5, Total	Weekly Avg	40 mg/L	2/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Monthly Avg	25 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	25 lbs/day	2/Week	Calculated	See 'TMDL Calculations' and 'TMDL Limitations for Total Suspended Solids' sections in permit.
Suspended Solids, Total	Monthly Avg	17 lbs/day	2/Week	Calculated	See 'TMDL Calculations' and 'TMDL Limitations for Total Suspended Solids' sections in permit.
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 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 permit.
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit effective May through September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May through September annually. See the 'E. coli Percent Limit' section in permit. Enter the result in the DMR on the last day of the month.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total	Daily Max	19 mg/L	2/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	19 mg/L	2/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	19 mg/L	2/Week	24-Hr Flow Prop Comp	
Chloride		mg/L	4/Month	24-Hr Flow Prop Comp	Sample on four consecutive days each month during calendar year 2027.
Phosphorus, Total	Monthly Avg	6.4 mg/L	Weekly	24-Hr Flow Prop Comp	Interim limit is effective upon reissuance and will remain in effect during the permit term per the phosphorus compliance schedule.
Phosphorus, Total		lbs/day	Weekly	Calculated	Monitoring only upon permit effective date. Final TMDL-based mass limits go into effect per the phosphorus compliance schedule. See 'TMDL Limitations for Total Phosphorus' section in 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 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 permit.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See 'Nitrogen Series Monitoring' subsection in

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					permit.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See 'Nitrogen Series Monitoring' subsection in permit.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See 'Nitrogen Series Monitoring' subsection in permit. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

2.1.1 Changes from Previous Permit

- **Total Suspended Solids TMDL Limits:** Mass based TSS limits of 25 lbs/day as a weekly average and 17 lbs/day as a monthly average have been added to the permit to comply with requirements of the Northeast Lakeshore TMDL. Effluent concentration (mg/L) shall be monitored and reported 2 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 have been replaced with Escherichia coli (E. coli) monitoring and limits. E. coli monitoring and limits are required at the permit effective date. E. coli limits of 126 #/100 ml as a monthly geometric mean that may not be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply**.**
- **Chloride:** Monitoring requirements for chloride were increased from once per month for one calendar year during the permit term, to 4 times per month on consecutive days for one calendar year during the permit term.
- **Phosphorus TMDL Limits:** An interim limit of 6.4 mg/L 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 1 time 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 0.46 lbs/day as a monthly average and 0.15 lbs/day as a six-month average will go into effect in accordance with compliance schedule 4.1.
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N):** Annual monitoring in rotating quarters throughout the permit term was added to the proposed permit.

Explanation of Limits and Monitoring Requirements

Monitoring Frequencies

Taking into consideration guidance and requirements in administrative code, effluent monitoring frequencies for the Village of Waldo's permit were determined to be appropriate for pollutants that have final effluent limits in effect during this permit term.

Categorical Limits

Total Suspended Solids, BOD_5, and pH: Standard municipal wastewater requirements for total suspended solids, and pH are included based on ch. NR 210, Wis. Adm. Code, 'Sewage Treatment Works' requirements for discharges to fish and aquatic life streams. Chapter NR 102, Wis. Adm. Code, 'Water Quality Standards for Surface Waters' also specifies requirements for pH for fish and aquatic life streams.

Water Quality Based Limits and Disinfection

Refer to the "Water Quality-Based Effluent Limitations for the Waldo Wastewater Utility", dated August 28, 2023, and "Phosphorus and TSS Water Quality-Based Effluent Limitations for Waldo Wastewater Utility", dated October 5, 2023, prepared by Nicole Krueger, and used for this reissuance.

- **E. Coli:** Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for E. coli while facilities are disinfecting during the recreation period and establish effluent limitations for E. coli established in s. NR 210.06 (2), Wis. Adm Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to E. coli to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code.

- **Ammonia Nitrogen:** Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia. Regulatory changes to s. NR 205.065, Wis. Adm. Code, became effective September 1, 2016, and require limits in this permit to be expressed as weekly average and monthly average limits whenever practicable. Therefore, weekly average and monthly average limits of 19 mg/L are included in the proposed permit.

- **Chloride:** Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 established the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. Because effluent concentrations are below the calculated WQBELs for chloride no effluent limits are included in the proposed permit. Chloride monitoring frequency was increased from once per month during one calendar year of the permit term to 4 times per month on consecutive days during calendar year 2027 to provide additional data that is more characteristic of the effluent, and to meet requirements of s. NR 106.85, Wis. Adm. Code.

- **Northeast Lakeshore Total Maximum Daily Load (TMDL):** The permitted facility is located within the Northeast Lakeshore Total Maximum Daily Load (NEL TMDL), which was approved by EPA October 30, 2023. 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 48 lbs/yr for phosphorus and 3,892 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 2023 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://prodoasint.dnr.wi.gov/swims/downloadDocument.do?id=167886175).

For phosphorus, continuously discharging facilities covered by the NEL 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 0.21 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 facilities covered by the NEL TMDL are given weekly average and monthly average mass limits.

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

- **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. Annual tests are scheduled in the following rotating quarters: July-September 2024, October-December 2025, April-June 2026, January-March 2027, and July-September 2028.
- **PFOS/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 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.

3 Septage Management - Proposed 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 disposes of septage at a designated treatment facility.

3.1 Sample Point Number: 901- Solids From Septic Tank

3.1.1 Changes from Previous Permit:

Septage management requirements were re-evaluated for the proposed permit term and no changes were made from the previous permit.

3.1.2 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 Total Phosphorus – TMDL Derived 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 March 31, 2027. The report shall provide a plan and schedule for implementation of the measures, improvements, and modifications as soon as possible, but not later than March 31, 2027 and state whether the measures, improvements, and modifications will 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 March 31, 2027 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 March 31, 2033.	03/31/2025
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.	03/31/2026
Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department.	03/31/2027

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.	
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.	03/31/2028
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications.	03/31/2029
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.)	03/31/2030
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..	06/30/2030
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades.	06/30/2031
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades.	06/30/2032
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades..	12/31/2033
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs.	03/31/2033

4.1.1 Explanation of Schedule

The facility is unable to consistently meet new TMDL mass-based limits for phosphorus upon permit reissuance. Subsection NR 217.17, Wis. Adm. Code, allows the department to provide a schedule of compliance for TMDL-based

phosphorus limits where the permittee cannot immediately achieve compliance. This schedule is included to provide time for the permittee to evaluate the treatment system and complete facility planning, design, and construction of upgrades needed to improve treatment efficiency and phosphorus removal. The schedule requires that the permittee comply with final TMDL-derived phosphorus limits as soon as reasonably possible, but no longer than 9 years from permit issuance, per s. NR 217.17 (2), Wis. Adm. Code.

Attachments:

"Water Quality-Based Effluent Limitations for the Waldo Wastewater Utility", prepared by Nicole Krueger, dated August 28, 2023.

"Phosphorus and TSS Water Quality-Based Effluent Limitations for Waldo Wastewater Utility", prepared Nicole Krueger, dated October 5, 2023.

Proposed Expiration Date:

March 31, 2029

Justification Of Any Waivers From Permit Application Requirements

No waivers were given from permit application monitoring and reporting requirements.

Prepared By:

Lisa Creegan, Wastewater Specialist

Date: February 7, 2024

Date (post fact check): February 29, 2024

Date (post public notice):

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 08/28/2023

TO: Melanie Burns – SER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for the Waldo Wastewater Utility
WPDES Permit No. WI-0022471-11

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 Waldo Wastewater Utility in Sheboygan County. This municipal wastewater treatment facility (WWTF) discharges to the Onion River, located in the Onion River Watershed in the Sheboygan River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

The following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
BOD_5			40 mg/L	25 mg/L	1
TSS			45 mg/L	30 mg/L	1
pH	9.0 s.u.	6.0 s.u.			1
Bacteria					2
Interim Limit Fecal Coliform				400 #/100 mL geometric mean	
Final Limit *E. coli*				126 #/100 mL geometric mean	
Ammonia Nitrogen	19 mg/L		**19 mg/L**	**19 mg/L**	1,3
Chloride					1,4
Phosphorus Interim Final				6.4 mg/L 1.1 mg/L 0.77 lbs/day	5
TKN, Nitrate+Nitrite, and Total Nitrogen					6

Footnotes:

1. No changes from the current permit.
2. Bacteria limits apply during the disinfection season of May through September. The fecal coliform interim limit will apply until the end of the compliance schedule when *E. coli* limits take effect. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
3. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, are included in bold.
4. Monitoring only.
5. A Total Maximum Daily Load (TMDL) is being developed for the Northeast Lakeshore Basin to address phosphorus water quality impairments within the TMDL area. This TMDL will likely result in limitations for TSS and phosphorus that must be included in WPDES permits, which may be different than those calculated for this reissuance. TMDL-derived limits may be included

in lieu of or in addition to the calculated limits upon permit reissuance or modification once the TMDL has been approved by U.S. EPA, according to s. NR 217.16, Wis. Adm. Code.

6. 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 (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).

No WET testing is required because information related to the discharge indicates low to no risk for toxicity.

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 (4) – Narrative, Outfall Map, 2005 Ammonia Calculations, & Thermal Table

PREPARED BY: Nicole Krueger, Water Quality Engineer – SER

E-cc: Curt Nickels, Wastewater Engineer – SER
Bryan Hartsook, Regional Wastewater Supervisor – SER
Diane Figiel, Water Resources Engineer – WY/3
Nathaniel Willis, Wastewater Specialist – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Waldo Wastewater Treatment Facility

WPDES Permit No. WI-0022471

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Waldo operates a recirculating sand filter WWTP. Influent comes into a wet well. Treatment consists of a rotary fine screen, a splitter box that sends the wastewater to two rows of three septic tanks, two recirculation tanks, eight sand filterbeds, and UV disinfection. Effluent is discharged to the Onion River and septic tank solids are hauled to another facility for treatment.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations

The current permit, expiring on 12/31/2023, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
BOD_5			40 mg/L	25 mg/L	1
TSS			45 mg/L	30 mg/L	1
pH	9.0 s.u.	6.0 s.u.			1
Fecal Coliform May – September			**656#/100 mL** **geometric mean**	400#/100 mL geometric mean	2
Ammonia Nitrogen	19 mg/L		19 mg/L	19 mg/L	2
Chloride					3
Phosphorus Interim Final				 6.4 mg/L Variable	4,5

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. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, are included in bold.
3. Monitoring only.
4. A compliance schedule is in the current permit to meet the final WQBELs by January 1, 2024.
5. The variable monthly average phosphorus limits are shown below:

Month	Monthly Average mg/L	Monthly Average lbs/day
Jan	1.31	0.947
Feb	1.31	0.947

Attachment #1

Month	Monthly Average mg/L	Monthly Average lbs/day
Mar	1.58	1.143
Apr	2.33	1.688
May	1.73	1.252
Jun	1.38	1.002
Jul	1.23	0.893
Aug	1.14	0.828
Sep	1.16	0.838
Oct	1.25	0.904
Nov	1.41	1.024
Dec	1.35	0.980

Receiving Water Information

- Name: Onion River
- Waterbody Identification Code (WBIC): 51200
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water 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-Q_{10} and 7-Q_2 values are from USGS for Station #04085800, where Outfall 001 is located.
  7-Q_{10} = 6.7 cfs (cubic feet per second)
  7-Q_2 = 8.8 cfs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7-Q_{10} (cfs)	8.2	8.2	10	15	11	8.7	7.7	7.1	7.2	7.8	8.9	8.5
7-Q_2 (cfs)	12	12	16	20	15	12	10	9.8	9.6	11	13	12

- Hardness = 357 mg/L as $CaCO_3$. This value represents the geometric mean of data from WET testing from the Onion River Wastewater Commission from 09/16/1999 – 10/31/2006.
- % 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: Metals data from the Onion River at Hwy E is used for this evaluation. The numerical values are shown in the tables below. 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 are described later.
- Multiple dischargers: There are several other dischargers to the Onion River however they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The immediate receiving water is 303(d) listed as impaired for total phosphorus.

Effluent Information

- Design flow rate(s):

Annual average = 0.087 MGD (Million Gallons per Day)

For reference, the actual average flow from 01/01/2019 – 06/30/2023 was 0.050 MGD.

- Hardness = 375 mg/L as $CaCO_3$. This value represents the geometric mean of data from 11/28/2022 – 12/15/2022.
- 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: None.
- 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 Data

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
11/28/2022	20	12/20/2022	16	01/17/2023	17
12/01/2022	29	12/28/2022	19	02/07/2023	19
12/06/2022	18	01/03/2023	19	02/14/2023	16
12/15/2022	17	01/10/2023	18		
1-day P_{99} = 29 µg/L					
4-day P_{99} = 23 µg/L					
Sample Date	Chloride mg/L	Sample Date	Chloride mg/L	Sample Date	Chloride mg/L
1/18/2022	472	5/3/2022	336	10/7/2022	433
2/8/2022	480	6/6/2022	380	11/7/2022	376
3/7/2022	419	7/4/2022	414	12/6/2022	405
4/5/2022	312	9/6/2022	449		
1-day P_{99} = 545 µg/L					
4-day P_{99} = 472 µg/L					

The following table presents the average concentrations and loadings at Outfall 001 from 01/01/2019 – 06/30/2023 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	Average Mass Discharged
BOD_5	7.5 mg/L*	
TSS	6.4 mg/L*	
pH field	6.7 s.u.	
Phosphorus	4.2 mg/L*	1.5 lbs/day
Ammonia Nitrogen	0.73 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 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 Waldo and the limits are set based on two times the acute toxicity criteria.

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 = 5.36 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

Attachment #1

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340	10	680	136	<0.989		
Cadmium	375	46.9	0.20	93.9	18.8	<0.19		
Chromium	301	4446	3	8892	1778	<1.1		
Copper	375	54.0	20	108			29	29
Lead	356	365	7.79	729	146	<4.3		
Nickel	268	1080	20	2161	432	<1.2		
Zinc	333	345	27.36	689	138	19		
Chloride (mg/L)		757	20.1	1514			545	480

* 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 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 1.675 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}
Arsenic		152	10	1922	384	<0.989	
Cadmium	175	3.82	0.20	48.9	9.77	<0.19	
Chromium	301	326	3	4342	868	<1.1	
Copper	357	30.8	20	165			23
Lead	356	95.5	7.79	1187	237	<4.3	
Nickel	268	120	20	1367	273	<1.2	
Zinc	333	345	27.36	4293	859	19	
Chloride (mg/L)		395	20.1	5060			472

* 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 = 2.96 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.
Cadmium	370	0.20	8490	1698.1	<0.19
Chromium (+3)	3818000	3	87656468	17531294	<1.1
Lead	140	7.79	3043	609	<4.3
Nickel	43000	20	986787	197357	<1.2

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 2.96 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	10	85.8	17.2	<0.989

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 not required for toxic substances in this section of the memo.

Chloride – Considering available effluent data from the current permit term (01/18/2022 – 12/06/2022), the 1-day P_{99} chloride concentration is 776 mg/L, and the 4-day P_{99} of effluent data is 547 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 – The permit application did not require monitoring for mercury because Waldo 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 Waldo 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(2), Wis. Adm. Code. Based on the type of discharge and the effluent flow rate, 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.

- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.
- 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:

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

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1639 sample results were reported from 01/02/2019 – 06/30/2023. The maximum reported value was 8.13 s.u. (Standard pH Units). The effluent pH was 7.17 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.26 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 7.24 s.u. Therefore, a value of 7.26 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 7.26 s.u. into the equation above yields an ATC = 27.5 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method
In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are either set equal to two times the 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.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q_{10} (estimated as 80 % of 7-Q_{10}) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	55
1-Q_{10}	1123

The 2×ATC method yields the most stringent limits for Waldo.

This limit is greater than the current daily maximum limit of 19 mg/L. If Waldo would like to request an increase to the existing permit limits an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets. Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current limits must be continued in the reissued permit. The Department would be unable to increase the limit due to the lack of need as shown via the antidegradation rule (ch. NR 207, Wis. Adm. Code) because the highest reported concentration was 4.72 mg/L during the previous permit term. No changes are

recommended in any of the permit limits for ammonia.

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
Weekly and monthly average limits are not included in the current permit but are being evaluated here due to changes to ch. NR 106, Wis. Adm. Code. **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 #3.

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from 01/06/2019 – 06/27/2023, with those results being compared to the calculated limits to determine the need to include ammonia limits in Waldo's permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P_{99}) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
1-day P_{99}	3.09
4-day P_{99}	1.73
30-day P_{99}	1.03
Mean	0.73
Std	0.62
Sample size	430
Range	0.0823 – 4.72

By comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits.

The permit currently has a daily maximum, weekly average, and monthly average limit of 19 mg/L 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.

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 in bold.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
Year round	19	**19**	**19**

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

On May 1, 2020, revisions to chs. NR 102 and NR 210, Wis. Adm. Code, 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 Waldo'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 through September. No changes are recommended to the current recreational period and the required disinfection season.

Interim Limit
At this time, there is no effluent *E. coli* data available to determine if these limits are currently met. The permit will include a compliance schedule to meet these limits. During the compliance schedule, an interim limit applies to prevent back-sliding from the current level of disinfection during the compliance schedule period. Therefore, the current **fecal coliform limit shall be included in the reissued permit as an interim limit of 400 counts/100 mL as a monthly geometric mean**. Any weekly geometric mean limit which was included in the current permit for expression of limits purposes does not need to be included in the permit as an interim limit.

PART 5 – 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 Waldo 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.
Jul 2022	5.53	1.39	64.3
Aug 2022	6.99	0.95	55.2

Attachment #1

Month	Monthly Avg. mg/L	Total Flow MG/month	Total Phosphorus lb./mo.
Sep 2022	7.01	0.94	55.0
Oct 2022	6.87	0.91	52.2
Nov 2022	5.71	0.94	44.6
Dec 2022	5.45	1.12	51.0
Jan 2023	5.62	1.22	57.1
Feb 2023	4.33	1.30	46.9
Mar 2023	2.16	2.80	50.6
Apr 2023	1.96	2.07	33.7
May 2023	4.47	1.37	51.1
Jun 2023	6.87	0.95	54.7
Average			51.4

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.

Water Quality-Based Effluent Limits (WQBEL)
Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.075 mg/L applies for the Onion River.

The conservation of mass equation is described in s. NR 217.13(2)(a), Wis. Adm. Code, for phosphorus WQBELs and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream phosphorus concentrations (Cs) provided below.

$$\text{Limitation} = [(WQC)(Qs+(1-f)\ Qe) - (Qs-f\ Qe)\ (Cs)]/Qe$$

Where:

WQC = 0.075 mg/L for the Onion River
Qs = 100% of the 7-Q_2 of 8.8 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.087 MGD = 0.135 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated as a median using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Code. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions.

A previous evaluation resulted in a WQBEL of 0.075 mg/L using a background concentration of 0.0548 mg/L from SWIMS station ID #10037857. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. Additional data were considered in estimating the background phosphorus concentration.

A review of all available in stream total phosphorus data from 07/23/2012 – 06/29/2018 (n=10) stored in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration in the Onion River 170 m upstream of Outfall 001 (SWIMS station ID 10037857) is 0.060 mg/L.

Substituting a median value of 0.060 mg/L into the limit calculation equation above, the calculated limit is 1.1 mg/L rounded to two significant figures.

The current permit has variable monthly phosphorus limits based on the monthly low flows. It's recommended that the annual low flow of 8.8 cfs is used instead for an annual limit because it is more protective of the receiving water.

Effluent Data
The following table summarizes effluent total phosphorus monitoring data from 01/07/2019 – 06/27/2023.

Total Phosphorus Effluent Data

	Phosphorus mg/L	**Phosphorus lbs/day**
1-day P_{99}	9.31	2.91
4-day P_{99}	6.45	2.12
30-day P_{99}	4.96	1.70
Mean	4.21	1.49
Std	1.61	0.47
Sample size	216	216
Range	<0.2 – 7.4	0.051 – 3.71

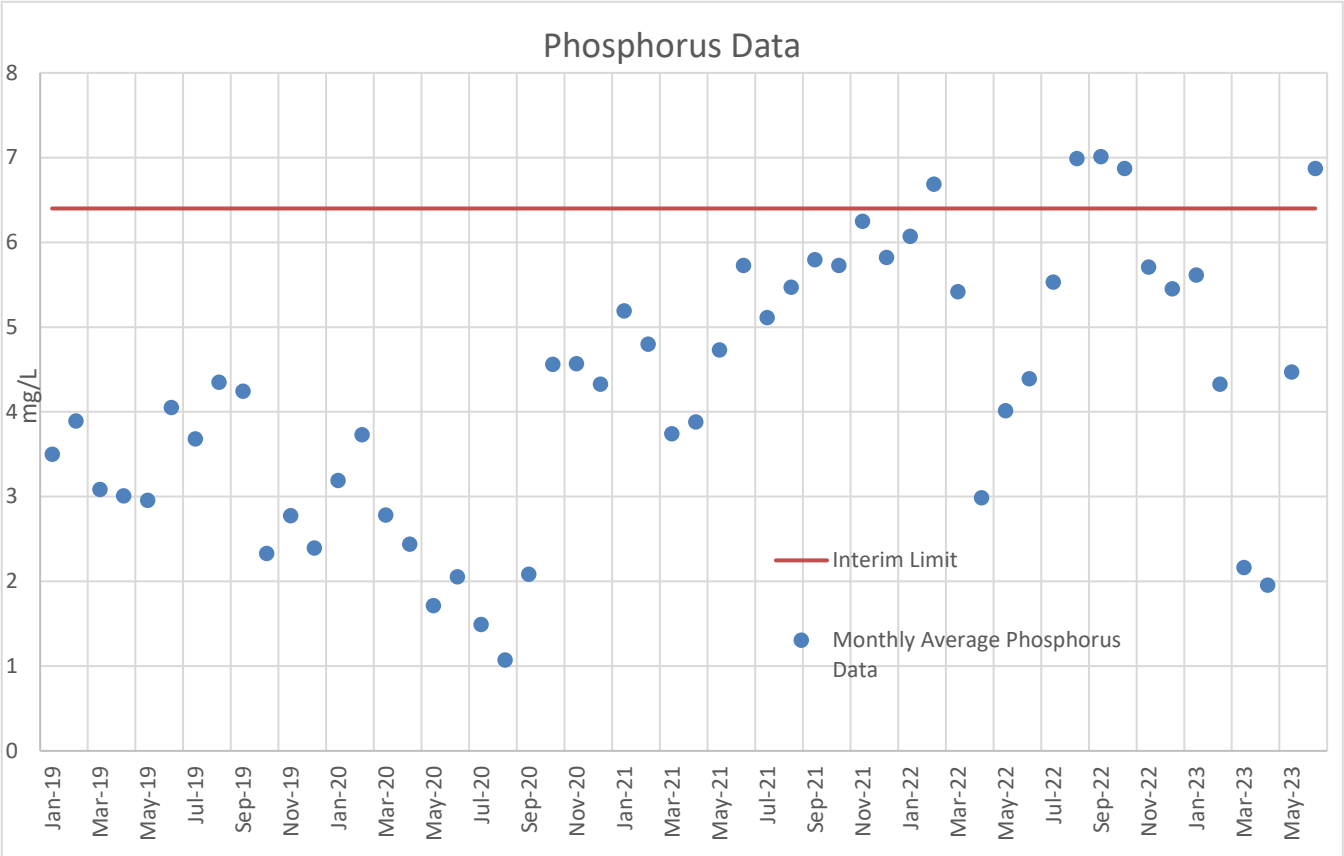
Reasonable Potential Determination
The discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion because the 30-day P_{99} of reported effluent total phosphorus data is greater than the calculated WQBELs**.** Therefore, **a WQBEL is required.**

Mass Limits
A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is to or upstream of phosphorus impaired water. **This final mass limit shall be 1.06 mg/L × 8.34 × 0.087 MGD = 0.77 lbs/day expressed as a monthly average.**

Interim Limit
An interim limit is required per s. NR 217.17, Wis. Adm. Code, when a compliance schedule is needed in the permit to meet the WQBEL. The interim limit should reflect a concentration that the facility is able to meet without investing in additional "temporary" treatment, but also should prevent backsliding from current conditions. Therefore, **it is recommended that the interim limit be set equal to 6.4 mg/L for permit reissuance along with requirements for optimization of phosphorus removal. This is equal to**

the current interim limit.

The effluent data from the current permit term is summarized below in comparison to the recommended monthly average interim limit.



TMDL Under Development

A Total Maximum Daily Load (TMDL) is being developed for the Northeast Lakeshore for phosphorus. The TMDL will address phosphorus water quality impairments within the basins and provide waste load allocations (WLA) required to meet water quality standards. This TMDL will likely result in phosphorus limitations that must be included in WPDES permits, which may be different than those calculated in this WQBEL memo. TMDL-derived phosphorus limits may be included in lieu of or in addition to the calculated limits upon permit reissuance or modification once the TMDL has been approved by U.S. EPA, according to s. NR 217.16, Wis. Adm. Code.

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 01/01/2019 – 06/30/2023.

The table below summarizes the maximum temperatures reported during monitoring from 04/01/2011 – 03/28/2012.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	48	48	NA	120
FEB	43	49	NA	120
MAR	52	54	NA	120
APR	47	48	98	114
MAY	53	54	88	114
JUN	58	60	NA	120
JUL	66	73	NA	120
AUG	67	68	NA	120
SEP	65	66	NA	120
OCT	64	65	NA	120
NOV	59	60	NA	120
DEC	55	55	NA	120

Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  (a) The highest recorded representative daily maximum effluent temperature
  (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

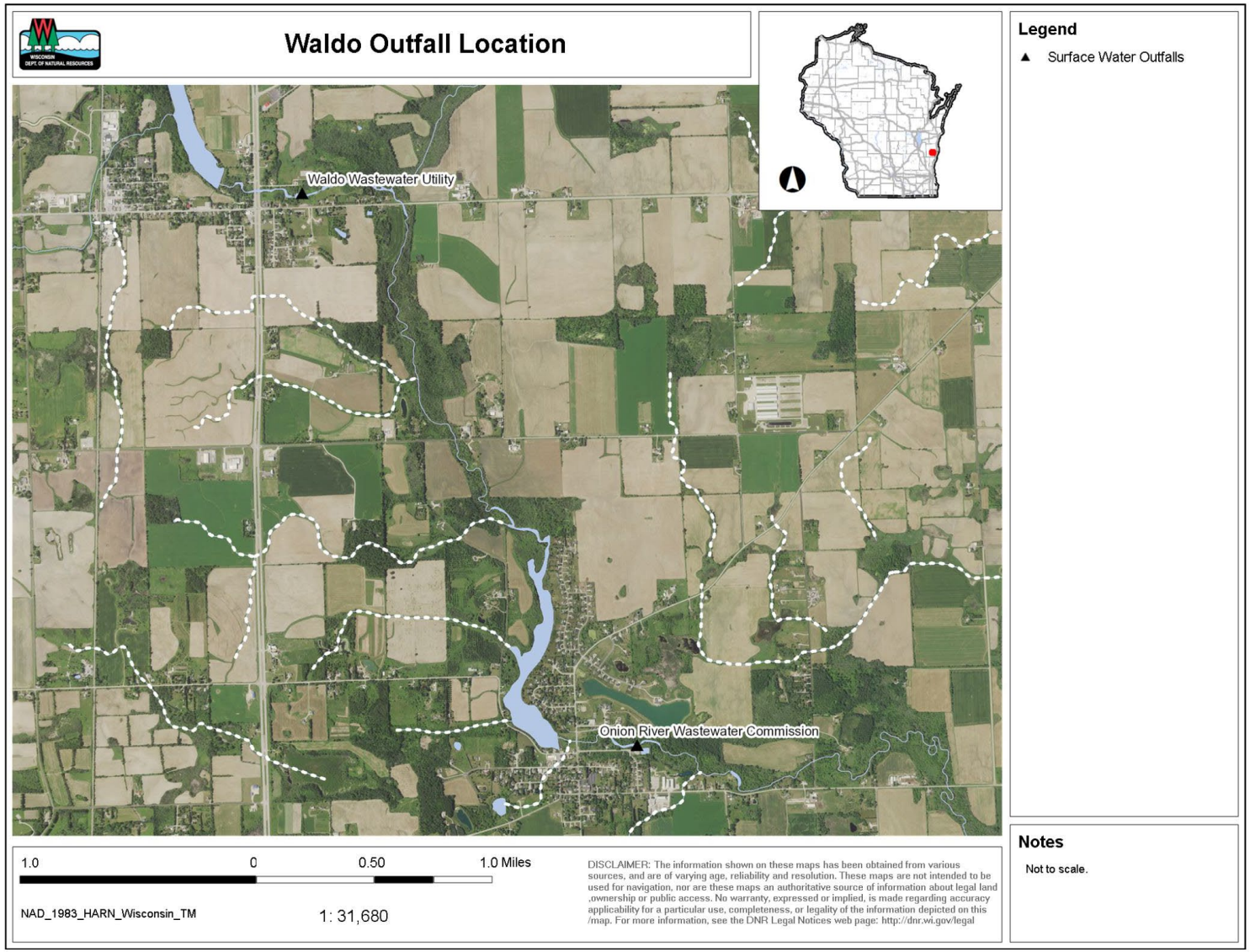
Based on the available effluent data no effluent limits are recommended for temperature. The complete thermal table used for the limit calculation is attached. **No limits or monitoring is recommended in the reissued permit.**

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).*

Guidance in Chapter 1.11 of the WET Guidance Document (WET Testing of Minor Municipal Discharges) was consulted. This is a minor municipal discharge (< 1.0 MGD) comprised solely of domestic wastewater, with no history of WET failures and no toxic compounds detected at levels of concern. No WET testing is recommended at this time because of the low risk in effluent toxicity.

Attachment #2



Attachment #3

2005 Ammonia Calculation

Changes for effluent limitations for ammonia are proposed to conform to changes to NR 105 and 106 of the Wisconsin Administrative Code, which includes updated ammonia criteria and procedures for determining effluent limitations. These changes were effective on March 1st, 2004.

Overview of Ammonia Rule Changes: The changes to NR 105 establish acute (daily) and chronic (weekly and monthly) criteria for ammonia in-stream, based on updated information on ammonia toxicity. Acute criteria are dependent on the classification of the receiving water and on the pH of the discharge. Chronic criteria are dependent on the classification, temperature and pH of the receiving water. In addition, the chronic criteria for most classifications of receiving water are dependent on the presence or absence of early life stages of fish. For fish species other than burbot, the presence of early life stages in assumed in April and when the average temperature is equal to or greater than 14.6 degrees Celsius. Burbot are known to reproduce in colder water beginning in January of the year. There have been a large number of surveys in the Southeastern Wisconsin river basins over the years, and no burbot have been found (communication with Sue Beyler, SER Fisheries Biologist). In addition, the Department's Master Fish file and Becker's Fishes of Wisconsin have no record of burbot in the Sheboygan River basin outside of the waters of Lake Michigan. Therefore, the criteria Onion River will not be determined to protect the early life stages of burbot.

The changes to NR 106 establish procedures for determining effluent limitations. For acute (daily maximum) limits, the limit equals twice the acute criterion established in conformance with NR 105, unless a zone of initial dilution has been approved for a discharger. For chronic (weekly average) limits, the limit is a mass balance based on the average annual design flow of the plant and a percentage of the average minimum 7-day flow that occurs once every ten years (7Q10). The percentage of stream flow used is related to the temperature of the stream. When the geometric average of the stream temperature is less than 11 degrees C., 25% of the stream flow is used. When the geometric average stream temperature is equal to or less than 16 degrees C., 50% of the stream flow is used. When the geometric average stream temperature is greater than 16 degrees C., 100% of the stream flow is used. Since the rate of breakdown of ammonia increases with increasing temperature, a greater percentage of the stream flow can be used.

In addition to the receiving water information given above, the following additional data was used to determine limitations for ammonia:

Receiving Water Temperature:
April-October = 23 degrees C.
November -March = 3 degrees C.

Receiving Water pH:
April-October = 8.21 std. units
November-March = 7.97 std. units

Background Ammonia Levels:
April-October = 0.07 mg/L
November-March = 0.25 mg/L

(based on typical background data for SE Wisconsin streams)

Calculated Limitations for Ammonia:

Based on the criteria in NR 105, the procedures for limit determinations in NR 106, and the effluent and stream data noted above, the limitations for ammonia were calculated for Waldo:

Calculated Ammonia Limitations		
	April-October	**November-March**
Daily Maximum	19.2 mg/l	19.2 mg/l
Weekly Average	71.9 mg/l	80.3 mg/l
Monthly Average	40.3 mg/l	43.8 mg/l

Chapter NR 106.33(2) indicates that whenever calculated ammonia limitations for a publicly owned treatment works exceed 20 mg/l in the summer or 40 mg/l in the winter, ammonia limitations will not be included in the permit. Accordingly, only the daily maximum limitation of 19 mg/l (rounded from 19 mg/l) will be considered for Waldo.

Attachment #4

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Waldo Wastewater Treatment		**7-Q_{10}:**	6.70	cfs		
Outfall(s):	001		**Dilution:**	25%		**Start:** 04/01/11	01/01/19
Date Prepared:	7/25/2023		**f:**	0		**End:** 03/28/12	06/30/23
Design Flow (Qe):	0.087	MGD	**Stream type:**	Small warm water sport or forage fish co			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	12.4	: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	6.70	0.077	0.108	0	48	48	NA	120
FEB	34	50	76	6.70	0.060	0.104	0	43	49	NA	120
MAR	38	52	77	6.70	0.105	0.155	0	52	54	NA	120
APR	48	55	79	6.70	0.177	0.968	0	47	48	98	114
MAY	58	65	82	6.70	0.327	0.811	0	53	54	88	114
JUN	66	76	84	6.70	0.079	0.141	0	58	60	NA	120
JUL	69	81	85	6.70	0.087	0.316	0	66	73	NA	120
AUG	67	81	84	6.70	0.064	0.089	0	67	68	NA	120
SEP	60	73	82	6.70	0.090	0.397	0	65	66	NA	120
OCT	50	61	80	6.70	0.172	0.308	0	64	65	NA	120
NOV	40	49	77	6.70	0.079	0.109	0	59	60	NA	120
DEC	35	49	76	6.70	0.079	0.115	0	55	55	NA	120

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 10/05/2023

TO: Lisa Creegan – SER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Phosphorus and TSS Water Quality-Based Effluent Limitations for Waldo Wastewater Utility -WPDES Permit No. (WI-0022471-11) in Sheboygan County.

This is in response to your request for an evaluation of the need for total phosphorus and total suspended solids (TSS) limitations for Waldo Wastewater Utility. The wastewater treatment plant discharges effluent at an annual average design flow rate of 0.087 MGD to the Onion River in the Onion River Watershed in the Sheboygan River Basin. This discharge is included in the Northeast Lakeshore Basin TMDL as approved by EPA.

The current permit, effective since 2019, has an interim phosphorus limit of 6.4 mg/L and TSS limits of 45 mg/L as a weekly average and 30 mg/L as a monthly average. The following review is based on the Northeast Lakeshore Basin Total Maximum Daily Load (TMDL) which was developed by the Department and approved by the US EPA. Recommendations are made in accordance with chapters NR 102, 104, 105, 106, 207, 212, and 217 of the Wisconsin Administrative Code, where applicable.

Receiving Water Information

- Name: Onion River
- Classification: Warmwater Sportfish
- Low Flow: 7-Q_{10} = 6.7 cfs (cubic feet per second)
- % of Flow used to calculate limits: 25%

Effluent Information

- Flow: Average Design Flow = 0.087 MGD
- Effluent characterization: This facility is categorized as a minor municipality
- Monitoring data: Data submitted by the facility to the department from 01/01/2019 – 06/30/2023 was used in this evaluation
- Total Phosphorus Wasteload Allocation: 48 lbs/year (see Appendix K of the TMDL document)
- Total Suspended Solids Wasteload Allocation: 3,892 lbs/year (see Appendix L of the TMDL document)

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 K of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Northeast Lakeshore Region* report are expressed as maximum annual loads (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 Northeast Lakeshore Basin 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:

TP Equivalent Effluent Concentration = WLA ÷ (365 days/yr * Flow Rate * Conversion Factor)
= 48 lbs/yr ÷ (365 days/yr * 0.087 MGD * 8.34)
= 0.18 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
= (48 lbs/yr ÷ 365 days/yr) * 1.16
= 0.15 lbs/day

TP Monthly Average Permit Limit = TP 6-Month Average Permit Limit * 3
= 0.15 lbs/day * 3
= 0.46 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 0.31. 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 0.63 mg/L, respectively, at the facility design flow of 0.087 MGD.

The TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries in the Northeast Lakeshore Basin. 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

An interim limit is needed when a compliance schedule is included in the permit to meet the 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's recommended that the interim limit be set equal to 6.4 mg/L, expressed as a monthly average. This value is equal to the current interim limit. The following table lists the statistics for effluent phosphorus levels from 01/07/2019 – 06/27/2023.

Total Phosphorus Statistics

	Concentration (mg/L)	Mass Discharge (lbs/day)
1-day P_{99}	9.31	2.91
4-day P_{99}	6.47	2.13
30-day P_{99}	4.96	1.70
Mean	4.21	1.49
Std	1.61	0.47
Sample Size	216	217
Range	0.78 – 7.4	0.051 – 3.71

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 WLAs found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Northeast Lakeshore Region* report are expressed as maximum annual loads (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.

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

TSS Weekly Average Permit Limit = WLA ÷ 365 days/yr * multiplier
= (3,892 lbs/yr ÷ 365 days/yr) * 1.59
= 17 lbs/day

TSS Monthly Average Permit Limit = WLA ÷ 365 days/yr * multiplier
= (3,892 lbs/yr ÷ 365 days/yr) * 2.37
= 25 lbs/day

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 1.24. 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 2/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 a concentration of 35 mg/L and 23 mg/L, respectively, at the facility design flow of 0.087 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 suspended solids monitoring data from 01/06/2019 – 06/27/2023.

Total Suspended Solids Effluent Data

	TSS mg/L	**TSS lbs/day**
1-day P_{99}	32.8	15.2
4-day P_{99}	18.0	8.22
30-day P_{99}	9.85	4.22
Mean*	6.44	2.58
Std	6.78	3.20
Sample size	432	432
Range	<3 – 107	0 – 41

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

Waldo can currently meet the TSS mass limits and a compliance schedule is not needed.

Conclusions:

The following is a summary of limits recommended by this evaluation:

- Interim Total Phosphorus limit of 6.4 mg/L
- Monthly average Total Phosphorus mass limit of 0.46 lbs/day
- Six-month average Total Phosphorus mass limit of 0.15 lbs/day

- Weekly average TSS concentration limit of 45 mg/L
- Monthly average TSS concentration limit of 30 mg/L
- Weekly average TSS mass limit of 25 lbs/day
- Monthly average TSS mass limit of 17 lbs/day

If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

PREPARED BY: Nicole Krueger, Water Resources Engineer

cc: Curt Nickels, Basin Engineer – SER