

# Permit Fact Sheet

## General Information

Permit Number	WI-0022608-11-0
Permittee Name and Address	Village of Sharon PO Box 379 125 Plain St, Sharon, WI 53585-0379
Permitted Facility Name and Address	Sharon Wastewater Treatment Facility N262 Salt Box Road
Permit Term	July 01, 2026 to June 30, 2031
Discharge Location	Northeast bank of Little Turtle Creek, immediately adjacent to the WWTF at N262 Salt Box Road.
Receiving Water	Little Turtle Creek in Turtle Creek Watershed of Lower Rock River Basin in Walworth County
Stream Flow (Q <sub>7,10</sub> )	0 cfs
Stream Classification	Limited Aquatic Life for 1.7 miles downstream, then Warm Water Forage Fish Community; non-public water supply.
Discharge Type	Existing and Continuous
Annual Average Design Flow (MGD)	0.257 MGD
Industrial or Commercial Contributors	None
Plant Classification	Basic with A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; L - Laboratory; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

## Facility Description

The Village of Sharon operates an extended aeration activated sludge wastewater treatment system. A mechanical bar screen is used to treat wastewater before the aeration system. Following treatment, a final clarifier settles the sludge. A plant upgrade, finalized in spring 2026, includes a new screening unit, phosphorus removal filtration system, VFD drive blowers, and a new clarifier. Waste activated sludge is aerobically digested, thickened, and stored before being land applied by a contract hauler on DNR approved sites.

The permittee has requested blending approval to continue as part of their permit application. Based on an evaluation of their request and associated documentation, blending is conditionally approved per s. NR 210.12(2), Wis. Adm. Code.

## Substantial Compliance Determination

### Enforcement During Last Permit:

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on 9/10/2024, this facility has been found to be in substantial compliance with their current permit.

- A notice of noncompliance was sent October 17, 2023, for WET limit exceedances, operator certification, and total phosphorus compliance schedule requirements. The village has completed all previously required actions as part of the enforcement process.
- Related to the phosphorus compliance schedule, the village has recently completed a significant facility upgrade as of spring 2026, and is expected to comply with total phosphorus limits moving forward.

After a desktop review of all discharge monitoring reports, CMARs, land applications reports, compliance schedule items, and a site visit on 9/10/2024, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Nick Lent, Wastewater Engineer on April 27, 2026.

## 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	0.12 MGD (2025)	INFLUENT: 24-hour flow proportional composite samples shall be collected after screening and equalization, before aeration. A Parshall flume with ultrasonic flow meter is located just prior to aeration basin. Sludge supernatant is included in the influent during periods when the sludge holding tank is decanted into the influent wet well.
001	0.12 MGD (2025)	EFFLUENT: 24-hour flow proportional composite samples and grab samples shall be collected downstream from the tertiary phosphorus treatment process. A 3” Parshall flume flow meter is located after tertiary phosphorus treatment. During periods of in-plant diversion (blending), representative sampling of influent is composited with a 24-hour flow proportional effluent sample for reporting for that day.
002	12.4 Tons (2025 Permit Application)	Aerobically digested, Class B liquid sludge. Representative sludge samples shall be collected from the sludge storage tank.
102		BLENDING: Sample point for reporting diverted flow from aeration and clarification during high flow events. Flow bypasses the aeration basin and final clarifier and mixes with treated effluent prior to discharge. The permittee shall notify the Department when blending occurs. See 'Blending' requirements in the Standard Requirements section of the permit.

## Permit Requirements

### 1 Influent – Monitoring Requirements

#### 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	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

### Changes from Previous Permit:

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

### 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: 102- In-Plant Diversion

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Per Occurrence	Continuous	See Blending Flow Section
Time		hours	Per Occurrence	Calculated	Report the total duration of blending within a given day (12:00am - 11:59pm) in which blending occurs. See Blending Flow permit section.

### 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.

### Explanation of Limits and Monitoring Requirements

Effluent monitoring is required at outfall 001 as defined in the permit during blending operations. Effluent limits effective at outfall 001 remain effective when blending occurs.

## 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	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	58.2 lbs/day	3/Week	Calculated	January, March, May, July, August, October, December
Suspended Solids, Total	Weekly Avg	63.5 lbs/day	3/Week	Calculated	February
Suspended Solids, Total	Weekly Avg	63.9 lbs/day	3/Week	Calculated	April, June, September, November
Suspended Solids, Total	Monthly Avg	41.3 lbs/day	3/Week	Calculated	January, March, May, July, August, October, December
Suspended Solids, Total	Monthly Avg	45 lbs/day	3/Week	Calculated	February
Suspended Solids, Total	Monthly Avg	45.3 lbs/day	3/Week	Calculated	April, June, September, November
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	Daily	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and Limit Effective May - September annually per the Effluent Limitations for E. Coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and Limit Effective May - September annually per the Effluent Limitations for E. Coli Schedule. See the E. Coli Percent Limit section. Enter the result in the DMR on

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					the last day of the month.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only in 2029
Phosphorus, Total	Monthly Avg	0.225 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	6-Month Avg	0.075 mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	4.79 lbs/day	3/Week	Calculated	January
Phosphorus, Total	Monthly Avg	4.32 lbs/day	3/Week	Calculated	February
Phosphorus, Total	Monthly Avg	3.29 lbs/day	3/Week	Calculated	March
Phosphorus, Total	Monthly Avg	2.24 lbs/day	3/Week	Calculated	April
Phosphorus, Total	Monthly Avg	1.84 lbs/day	3/Week	Calculated	May
Phosphorus, Total	Monthly Avg	2.11 lbs/day	3/Week	Calculated	June
Phosphorus, Total	Monthly Avg	2.51 lbs/day	3/Week	Calculated	July
Phosphorus, Total	Monthly Avg	3.11 lbs/day	3/Week	Calculated	August
Phosphorus, Total	Monthly Avg	3.79 lbs/day	3/Week	Calculated	September
Phosphorus, Total	Monthly Avg	3.77 lbs/day	3/Week	Calculated	October
Phosphorus, Total	Monthly Avg	4.66 lbs/day	3/Week	Calculated	November
Phosphorus, Total	Monthly Avg	4.73 lbs/day	3/Week	Calculated	December
Phosphorus, Total	6-Month Avg	0.161 lbs/day	3/Week	Calculated	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	7.8 mg/L	3/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH3-N) Total	Daily Max	7.5 mg/L	3/Week	24-Hr Flow Prop Comp	October, April
Nitrogen, Ammonia (NH3-N) Total	Daily Max	7.4 mg/L	3/Week	24-Hr Flow Prop Comp	November - March
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	3.9 mg/L	3/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	7.5 mg/L	3/Week	24-Hr Flow Prop Comp	October
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	7.4 mg/L	3/Week	24-Hr Flow Prop Comp	November - March
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	6.0 mg/L	3/Week	24-Hr Flow Prop Comp	April

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.6 mg/L	3/Week	24-Hr Flow Prop Comp	May - September
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.1 mg/L	3/Week	24-Hr Flow Prop Comp	October
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.2 mg/L	3/Week	24-Hr Flow Prop Comp	November - March
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.4 mg/L	3/Week	24-Hr Flow Prop Comp	April
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring Section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring Section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring Section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Chronic WET	Monthly Avg	1.0 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Biannual for first two years, annual thereafter. See WET Testing Section

### 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.

- **DO** – Sample frequency updated
- **E. coli**- Escherichia coli (E. coli) monitoring and limits added at the end of the compliance schedule.
- **Chloride** – Monitoring year updated.
- **TP** – Sample frequency increased.
- **WET Testing** – Frequency updated.

### 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 3/17/2026.

**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. Frequency of DO has been updated to match pH. Frequency of Total Phosphorus has been updated to allow for a more reliable demonstration of compliance with effluent limits. Due to significant fluctuations observed in flow rates as recently as 2026, effluent conditions can change quickly, and a more frequent monitoring requirement is necessary.

**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 average and monthly average limits whenever practicable.

**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.

Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. Section NR 102.04(5)(b), Wis. Adm. Code, states that exceptions to the disinfection requirement can be made if the department determines, in accordance with the procedures specified in s. NR 210.06(3), Wis. Adm. Code, that disinfection is not required to meet water quality criteria. As part of the reissuance process, the requirements for disinfection were reviewed under s. NR 210.06(3), Wis. Adm. Code.

It was determined that the permittee is required to disinfect, during May – September. See WQBEL for further explanation.

**TMDL** - A total maximum daily load (TMDL) was developed for the Rock River Basin to determine the maximum amounts of phosphorus and sediment that can be discharged to protect and improve water quality. The Rock River Basin's TMDL was approved by the Environmental Protection Agency (EPA) on September 28, 2011. These final effluent limits were derived from and comply with the applicable water quality criterion and is consistent with the assumptions and requirements of the EPA-approved wasteload allocation (WLA) for the Rock River. The entire report can be found at: <https://dnr.wisconsin.gov/topic/TMDLs/RockRiver/index.html>. The proposed permit includes limitations and requirements necessary to implement the recommendations of the TMDL.

- **Suspended Solids, Total:** The TMDL mass limits are in addition to the concentration limit for suspended solids. The approved total suspended solids TMDL limits for this permittee are expressed as weekly average and monthly average effluent limits and were already effective during the previous permit term.
- **Phosphorus:** Wasteload allocations specified in TMDLs are expressed as WQBELs (water quality based effluent limits). The WLA-derived WQBELs are consistent with the assumptions and requirements of the approved Rock River TMDL. The approved total phosphorus TMDL limits for this permittee are expressed as monthly average effluent limits and were already effective during the previous permit term.

**WET** – According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 1.0 TUC as a monthly average in the effluent limits table of the permit. The WET limit is currently effective and shall continue although the available data is not considered representative due to antidegradation and antibacksliding purposes per ch. NR 207, Wis. Adm. Code. Chronic tests performed 2x/year for the first two years of the reissued permit are required to ensure the upgraded facility will remove toxicity more efficiently. After 2 years, annual chronic tests are required annually.

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

## 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)
002	B	Liquid	Fecal Coliform	Injection and Incorporation	Land Application	12.4 Tons
Does sludge management demonstrate compliance? <b>Yes</b>						
Is additional sludge storage required? <b>No</b>						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? <b>No</b>						
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? <b>No, flow &lt; 5 MGD.</b>						
Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

### 4.1 Sample Point Number: 002- Liquid Sludge

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	
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	

<b>Monitoring Requirements and Limitations</b>					
<b>Parameter</b>	<b>Limit Type</b>	<b>Limit and Units</b>	<b>Sample Frequency</b>	<b>Sample Type</b>	<b>Notes</b>
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	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	January - December 2027
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	January - December 2027
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

### **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.

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

### **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 Wis. Adm. Code s. NR 204.07(5). Requirements for pathogens are specified in Wis. Adm. Code s. NR 204.07(6) and in Wis. Adm. Code s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in Wis. Adm. Code s. NR 204.07(3)(k).

**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 Upgrade Blending Sampling Method

Required Action	Due Date
<b>Submit Blending Sampling Action Plan:</b> Submit a proposed Blending Sampling Action Plan. The action plan should identify the necessary modifications to sampling methods and protocols so that 24-hour flow proportional samples can be taken when blending. The equipment and location shall be able to sample fully treated wastewater mixed with the diverted wastewater. The sampler may be temporary or permanent. If construction to the existing treatment plant is necessary, the permittee shall submit plans and specifications for Department approval prior to construction.	12/31/2026
<b>Submit Plans and Specifications:</b> Submit plans and specifications for Department approval if required for representative sampling of blended events for Outfall 001.	03/31/2027
<b>Submit Progress Report:</b> Submit progress report regarding the progress of achieving compliance with 24-hour flow proportional sampling during blending events.	06/30/2027
<b>Achieve Compliance:</b> The permittee shall achieve compliance with 24-hour flow proportional required sampling during blending events.	12/31/2027

### Explanation of Schedule

A schedule is included in the permit to upgrade the current sample technology for when blending events take place. This will allow for a more accurate representation of effluent quality during blending events.

### 5.2 Disinfection and Effluent Limitations for E. coli (Outfall 001)

The permittee shall comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance.

Required Action	Due Date
<b>Progress Report:</b> The permittee shall submit a progress report on development and submittal of a facility plan for upgrades to meet disinfection requirements and <i>E. coli</i> limits.	03/31/2027
<b>Submit Facility Plan:</b> The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with <i>E. coli</i> surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	01/31/2028
<b>Final Plans and Specifications:</b> The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to meet disinfection requirements per s. NR 210.06(1), Wis. Adm	01/31/2029

Code, achieve compliance with final <i>E. coli</i> limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below.	
<b>Treatment Plant Upgrade to Meet Limitations:</b> The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. 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.	07/31/2029
<b>Construction Upgrade Progress Report:</b> The permittee shall submit a progress report on construction upgrades.	07/01/2030
<b>Complete Construction:</b> The permittee shall complete construction of wastewater treatment system upgrades.	01/31/2031
<b>Achieve Compliance:</b> The permittee shall achieve compliance with final <i>E. coli</i> limitations.	04/30/2031

### Explanation of Schedule

A compliance schedule is included in the permit to provide time for the permittee to investigate options for meeting new effluent *E. coli* water quality-based effluent limits.

### 5.3 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
<b>Land Application Management Plan Submittal:</b> 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 land spreading 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.	12/31/2026

### Explanation of Schedule

An up-to-date Land Application Management Plan is required that documents how the permittee will manage the land application of biosolids consistent with ch. NR 204, Wis. Adm. Code.

### Attachments

Water Quality Based Effluent Limits dated 3/17/2026

### Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

**Prepared By: Marissa Fleege Wastewater Specialist**

**Date: 4/3/2026**

**Date Amended Post Internal Review: 4/27/2026**

**Date Amended Post Fact Check:**

**Date Amended Post Public Notice:**

# CORRESPONDENCE/MEMORANDUM

DATE: 03/17/2026

TO: Marrisa Fleege – SER

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Sharon Wastewater Treatment Facility  
WPDES Permit No. WI-000022608-11

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 Sharon Wastewater Treatment Facility in Walworth County. This municipal wastewater treatment facility (WWTF) discharges to the Little Turtle Creek located in the Turtle Creek Watershed in the Lower Rock River Basin. This discharge is included in the Rock River TMDL as approved by the EPA in July 2011. 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						1,2
BOD <sub>5</sub>			30 mg/L	20 mg/L		1
TSS TMDL			30 mg/L See Table	20 mg/L See Table		1,3
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1
Bacteria						4
Final Limit <i>E. coli</i>				126 #/100 mL geometric mean		
Chloride						5
Phosphorus  TMDL				0.225 mg/L  See Table	0.075 mg/L 0.161 lbs/day	1,3
Ammonia Nitrogen April May – September October November – March	7.5 mg/L 7.8 mg/L 7.5 mg/L 7.4 mg/L		6.0 mg/L 3.9 mg/L <b>7.5 mg/L</b> <b>7.4 mg/L</b>	2.4 mg/L 1.6 mg/L 3.1 mg/L 4.2 mg/L		6
TKN, Nitrate+Nitrite, and Total Nitrogen						1,7
Chronic WET				1.0 TUc		8,9

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. Additional mass limits based on the Rock River TMDL is shown below:

**Rock River TMDL Limits**

<b>Month</b>	<b>Weekly Average TSS Limit (lbs/day)</b>	<b>Monthly Average TSS Limit (lbs/day)</b>	<b>Monthly Average Total Phosphorus Limit (lbs/day)</b>
January	58.2	41.3	4.79
February	63.5	45.0	4.32
March	58.2	41.3	3.29
April	63.9	45.3	2.24
May	58.2	41.3	1.84
June	63.9	45.3	2.11
July	58.2	41.3	2.51
August	58.2	41.3	3.11
September	63.9	45.3	3.79
October	58.2	41.3	3.77
November	63.9	45.3	4.66
December	58.2	41.3	4.73

4. Bacteria limits apply during the disinfection season of May through September at the end of a compliance schedule. **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. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
6. 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.
7. 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<sub>3</sub>), nitrite (NO<sub>2</sub>), and total kjeldahl nitrogen (TKN) (all expressed as N).
8. 2x/year of chronic WET testing is recommended for the first two years of the permit term which may be reduced to annual WET testing for the rest of the term. The Instream Waste Concentration (IWC) to assess chronic test results is 100%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5%. The primary control water used in chronic WET tests conducted on Outfall 001 shall be a grab sample collected from the Little Turtle Creek.
9. 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. Testing 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 Nicole Krueger at [Nicole.Krueger@wisconsin.gov](mailto:Nicole.Krueger@wisconsin.gov) or Diane Figiel at [Diane.Figiel@wisconsin.gov](mailto:Diane.Figiel@wisconsin.gov).

Attachments (4) – Narrative, Outfall Map, 2009 Ammonia Limits Calculations, & Thermal Table

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

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

**WPDES Permit No. WI-0022608-11**

Prepared by: Nicole Krueger

**PART 1 – BACKGROUND INFORMATION**

**Facility Description**

The Village of Sharon Wastewater Treatment Plant serves a population of approximately 1,600 residents with no significant industrial contributors. The facility is an extended aeration activated sludge wastewater treatment system constructed in 1984. Waste stream processes include mechanical fine screening, flow equalization, flow monitoring, activated sludge aeration, and final clarification. Effluent is aerated before discharge into the Little Turtle Creek. Waste activated sludge is aerobically digested, thickened, and stored before being land applied by a contract hauler on Department approved agricultural fields.

Sharon is currently going through a treatment plant upgrade which includes a new screening unit, phosphorus removal filtration system, VFD drive blowers, and a new clarifier which is expected to be fully operational in spring 2026.

The permittee has requested blending approval as part of their permit application. Based on an evaluation of their request and associated documentation, blending is reviewed outside of this memo and was approved per s. NR 210.12(2), Wis. Adm. Code.

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

**Existing Permit Limitations**

The current permit, expiring on June 30, 2025, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD <sub>5</sub>			30 mg/L	20 mg/L		2,3
TSS TMDL			30 mg/L See Table	20 mg/L See Table		2,4
pH	9.0 s.u.	6.0 s.u.				2,3
Dissolved Oxygen		4.0 mg/L				2,3
Phosphorus  TMDL				0.225 mg/L  See Table	0.075 mg/L 0.161 lbs/day	4
Ammonia Nitrogen April May – September October November – March	7.5 mg/L 7.8 mg/L 7.5 mg/L 7.4 mg/L		6.0 mg/L 3.9 mg/L <b>7.5 mg/L</b> <b>7.4 mg/L</b>	2.4 mg/L 1.6 mg/L 3.1 mg/L 4.2 mg/L		5

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
TKN, Nitrate+Nitrite, and Total Nitrogen						1
Acute WET						6
Chronic WET				1.0 TUc		6

Footnotes:

1. Monitoring only.
2. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. 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.
4. Additional mass limits based on the Rock River TMDL is shown below:

Month	Weekly Average TSS Limit (lbs/day)	Monthly Average TSS Limit (lbs/day)	Monthly Average Total Phosphorus Limit (lbs/day)
January	58.2	41.3	4.79
February	63.5	45.0	4.32
March	58.2	41.3	3.29
April	63.9	45.3	2.24
May	58.2	41.3	1.84
June	63.9	45.3	2.11
July	58.2	41.3	2.51
August	58.2	41.3	3.11
September	63.9	45.3	3.79
October	58.2	41.3	3.77
November	63.9	45.3	4.66
December	58.2	41.3	4.73

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. Acute WET testing is required twice during the permit term. Chronic WET testing is required annually and the IWC is 100%.

**Receiving Water Information**

- Name: Little Turtle Creek
- Waterbody Identification Code (WBIC): 791700
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited Aquatic Life (LAL) community from outfall to 1.7 miles downstream at the Rock/Walworth County line (listed in Table 4 in ch. NR 104, Wis. Adm. Code), then the classification changes to Warm Water Forage Fish (WWFF) community. This is also classified as an Exceptional Resource Water. Biologists found over 600 fish, 16 different species, at Highway 67 which is approximately 1.7 miles downstream of Sharon's outfall.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q<sub>10</sub> and 7-Q<sub>2</sub> values are from USGS for Station LR67, where Outfall 001 is located.

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LAL and WWFF classification  
 7-Q<sub>10</sub> = 0 cfs (cubic feet per second)  
 7-Q<sub>2</sub> = 0 cfs

- Hardness = 353 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of data from chronic WET testing from 02/11/2020 – 09/14/2021.
- % 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 concentrations are not included because they do not impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None.
- Impaired water status: The immediate receiving water is not 303(d) listed as impaired. The Little Turtle Creek at South Clowes Road at the Rock/Walworth County line is 303(d) impaired for total phosphorus.

**Effluent Information**

- Design flow rate(s):  
 Annual average = 0.257 MGD (Million Gallons per Day)  
 Peak daily = 0.891 MGD  
 Peak weekly = 0.730 MGD  
 Peak monthly = 0.545 MGD

For reference, the actual average flow from 07/01/2020 – 11/30/2025 was 0.16 MGD. This average flow is based on influent flow from Outfall 701 due to the effluent flow meter not operating correctly for much of the permit term.

- Hardness = 360 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of data from the 4 samples from April 2025 reported in 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 water supply from wells.
- Additives: Rare Earth is added for phosphorus removal.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

**Effluent Copper & Chloride Data**

Sample Date	Copper µg/L	Sample Date	Chloride mg/L
04/09/2025	6.4	01/31/2024	210
04/12/2025	3.9	02/28/2024	270

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Sample Date	Copper µg/L	Sample Date	Chloride mg/L
04/15/2025	4.7	03/27/2024	110
04/18/2025	3.2	04/24/2024	390
04/21/2025	5.4	05/29/2024	160
04/24/2025	8.4	06/27/2024	140
04/27/2025	8.6	07/25/2024	150
04/30/2025	4.0	08/29/2024	270
05/03/2025	8.1	09/26/2024	240
05/06/2025	5.3	10/22/2024	320
05/09/2025	5.2	11/20/2024	310
		12/27/2024	300
1-day P <sub>99</sub>	12	1-day P <sub>99</sub>	507
4-day P <sub>99</sub>	8.3	4-day P <sub>99</sub>	357

The following table presents the average concentrations and loadings at Outfall 001 from 07/01/2020 – 11/30/2025 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 <sub>5</sub>	6.7 mg/L	
TSS	9.6 mg/L*	11.1 lbs/day
pH field	7.69 s.u.	
Phosphorus	1.47 mg/L*	1.45 lbs/day
Ammonia Nitrogen	0.26 mg/L*	
Dissolved Oxygen	7.58 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 99<sup>th</sup> percentile (or P<sub>99</sub>) 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<sub>10</sub>**

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<sub>10</sub> receiving water low flow to determine if more restrictive effluent

limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

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

Q<sub>s</sub> = average minimum 1-day flow which occurs once in 10 years (1-day Q<sub>10</sub>)  
 if the 1-day Q<sub>10</sub> flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q<sub>10</sub>).

Q<sub>e</sub> = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

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

C<sub>s</sub> = 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<sub>10</sub> method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case for Sharon.

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

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC)**

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P <sub>99</sub>	1-day MAX. CONC.
Arsenic		340	340	68.0	<1.1		
Cadmium	360	44.7	44.7	8.94	<0.17		
Chromium	301	4446	4446	889	<1.5		
Copper	360	51.9	51.9			12	8.6
Lead	356	365	365	72.9	<5.4		
Nickel	268	1080	1080	216	<4.7		
Zinc	333	345	345	68.9	<5.9		
Chloride (mg/L)		757	757			507	390

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

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

**Weekly Average Limits based on Chronic Toxicity Criteria (CTC)**

RECEIVING WATER FLOW = 0 cfs

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SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P <sub>99</sub>
Arsenic		152	152	30.4	<1.1	
Cadmium	175	3.82	3.82	0.76	<0.17	
Chromium	301	326	326	65.2	<1.5	
Copper	339	29.4	29.4			8.3
Lead	339	91.1	91.1	18.2	<5.4	
Nickel	268	120	120	24.0	<4.7	
Zinc	333	345	345	68.9	<5.9	
Chloride (mg/L)		395	395			357

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

**Monthly Average Limits based on Wildlife Criteria (WC)**

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

**Monthly Average Limits based on Human Threshold Criteria (HTC)**

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HTC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	370	74.0	<0.17
Chromium (+3)	3818000	3818000	763600	<1.5
Lead	140	140	28.0	<5.4
Nickel	43000	43000	8600	<4.7

**Monthly Average Limits based on Human Cancer Criteria (HCC)**

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	13.3	2.66	<1.1

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 parameters in this section.

Chloride – Considering available effluent data from the current permit term (01/31/2024 – 12/27/2024), the 1-day P<sub>99</sub> chloride concentration is 507 mg/L, and the 4-day P<sub>99</sub> of effluent data is 357 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 Sharon 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), Wis. Adm. Code.” A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 10/13/2020 – 10/15/2024 was nondetect. Therefore, **no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Available monitoring sample data from the Sharon Waterworks (PWS ID: 26501453) is provided in the table below:

**Water Supply PFAS Data**

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
05/31/2023	CB05755-03	AX010	ND	ND
05/31/2023	CB05755-01	BH188	ND	ND
06/21/2023	626722001	AX010	ND	ND
06/21/2023	626718001	BH188	ND	ND
Average =			0	0

The limited data above shows the municipal water supply is below 1/5<sup>th</sup> of the applicable PFOS and PFOA criteria.

Based on the effluent flow rate, the lack of indirect dischargers contributing to the collection system and known nondetectable levels of PFOS/PFOA in the source water, **PFOS and PFOA monitoring is not recommended.** 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.

### **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:

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

Where:

- A = 0.633 and B = 90.0 for Limited Aquatic Life,
- 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 1458 sample results were reported from 01/01/2021 – 12/31/2024. The maximum reported value was 8.0 s.u. (Standard pH Units). The effluent pH was 7.8 s.u. or less 99% of the time. The 1-day P<sub>99</sub>, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.9 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 7.9 s.u. Therefore, a value of 7.9 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 7.9 s.u. into the equation above yields an ATC = 16 mg/L for the LAL segment and 10 mg/L for the downstream WWFF segment.

**Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method**

In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the the 1-Q<sub>10</sub> receiving water low flow 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<sub>10</sub> (estimated as 80 % of 7-Q<sub>10</sub>) and the 2×ATC approach are shown below.

**Daily Maximum Ammonia Nitrogen Determination – LAL**

	Ammonia Nitrogen Limit mg/L
2×ATC	31
1-Q <sub>10</sub>	16

**Daily Maximum Ammonia Nitrogen Determination – WWFF**

	Ammonia Nitrogen Limit mg/L
2×ATC	20
1-Q <sub>10</sub>	10

The 1-Q<sub>10</sub> method yields the most stringent limits for Sharon for the WWSF classification.

These limits are greater than the current daily maximum limits which range between 7.4 mg/L to 7.8 mg/L. If Sharon would like to request an increase to the existing permit limits an assessment of their

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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. There were several daily maximum exceedances in October 2020 and September 2021 which were caused by temporary upsets and not representative of normal treatment conditions.

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 representative concentration was 5.2 mg/L during the previous permit term excluding the data that was collected and reported during the temporary upsets. No changes are recommended in any of the permit limits for ammonia.

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

**The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change** because there have been no changes in the effluent and receiving water flow rates. The calculations from the 2009 WQBEL memo are shown in Attachment #3.

**Effluent Data**

The following table evaluates the statistics based upon ammonia data reported from 07/01/2020 – 11/14/2025 with those results being compared to the calculated limits to determine the need to include ammonia limits in Sharon’s permit for the respective month ranges. That need is determined by calculating 99<sup>th</sup> upper percentile (or P<sub>99</sub>) 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	April	May – September	October	November - March
1-day P <sub>99</sub>	1.04	1.43	1.55	1.94
4-day P <sub>99</sub>	0.54	0.76	0.81	1.08
30-day P <sub>99</sub>	0.24	0.33	0.35	0.45
Mean*	0.11	0.15	0.15	0.15
Std	0.30	0.40	0.46	0.69
Sample size	74	357	72	332
Range	<0.077 - 1.15	<0.077 - 2.41	<0.077 - 2.05	<0.077 - 5.17

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

Based on this comparison, there is no reasonable potential for ammonia limits.

The permit currently has daily maximum, weekly average, and monthly average limits year-round.

**Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential**, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

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

**Conclusions and Recommendations**

In summary, **no changes are recommended, and the recommended limits are shown below.** 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
April	7.5	6.0	2.4
May – September	7.8	3.9	1.6
October	7.5	<b>7.5</b>	3.1
November – March	7.4	<b>7.4</b>	4.2

**PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA**

Section NR 102.04(5), Wis. Adm. Code, states that all surface waters shall be suitable for supporting recreational use and shall meet *E. coli* criteria during the recreation season. Section NR 102.04(5)(b), Wis. Adm. Code, allows the Department to make exceptions when it determines, in accordance with s. NR 210.06(3), Wis. Adm. Code, that wastewater disinfection is not required to meet *E. coli* limits and protect the recreational use. Section NR 210.06(3), Wis. Adm. Code, tasks the Department with determining the need for disinfection using a site-specific analysis based on potential risk to human or animal health. It sets out the factors that must be considered in determining the necessity to disinfect municipal wastewater or to change the length of the disinfection season.

Sharon had previously been exempted from disinfection based on the LAL or limited forage fish (LFF) community classification of the receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (**not** on the water quality classifications - i.e., LAL, LFF - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for the Little Turtle River is listed in ch. NR 104, Wis. Adm. Code, as continuous. Continuous streams have a higher likelihood of providing opportunities for full contact recreational activities. Therefore, disinfection should not be exempted based solely on this hydrological classification.

The Department has considered the information required by s. NR 210.06(3), Wis. Adm. Code, and has determined that the discharge cannot meet bacteria limits without disinfection. 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.

**These limits are required during May through September.** The permit will include a compliance schedule to meet these limits to give time to install disinfection treatment.

**Total Residual Chlorine – If Sharon decides to upgrade to use chlorination for disinfection, effluent limitations would be 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 19 µg/L would be required if Sharon decides to use chlorination for disinfection.** Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. The calculated **weekly average effluent limitation of 7.3 µg/L would also be included in the permit because it is more restrictive than the daily maximum limit.**

Sections NR 106.07(3) and NR 205.067(7), Wis. Adm. Code require WPDES permits contain weekly average and monthly average limitations for municipal dischargers whenever practicable and necessary to protect water quality. **Therefore, a weekly average and monthly average limit of 7.3 µg/L would also be required** to meet expression of limits requirements in addition to the daily max limit.

## **PART 5 – PHOSPHORUS**

### **Water Quality Based Limit – Phosphorus**

Revisions to the administrative rules for phosphorus discharges took effect on December 1, 2010. These rule revisions include additions to ch. NR 102 (s. NR 102.05), which establish phosphorus standards for surface waters. Revisions to ch. NR 217 (s. NR 217, Subchapter III) establish procedures for determining water quality based effluent limits for phosphorus, based on the applicable standards in ch. NR 102.

The Department has developed a TMDL for the Upper and Lower Rock River Basins. The US EPA approved the Rock River TMDL on September 28, 2011. The document, along with the referenced appendices can be found at: <https://dnr.wisconsin.gov/topic/TMDLs/RockRiver/index.html>

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL-derived water quality based effluent limit (WQBEL) for phosphorus in addition to, or in lieu of, a s. NR 217.13 WQBEL in a WPDES permit. Because the TMDL WLAs are not protective of the immediate receiving water, the s. NR 217.16, Wis. Adm. Code, limits are required in addition to the TMDL-based limits. This limit should be expressed in a manner consistent with the wasteload allocation and assumptions of the TMDL. If after two permit terms, the Department determines the nonpoint source load allocation has not been substantially reduced, the Department may include the s. NR 217.13 WQBEL unless these reductions are likely to occur.

### **TMDL Limits**

The monthly average total phosphorus (Total P) effluent limits in lbs/day are calculated based on the monthly phosphorus wasteload allocation (WLA) given in pounds per month as suggested in the *TMDL Implementation Guidance for Wastewater Permits* dated October 1, 2019. The WLA for this facility is found in the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin* report dated July 2011. The limits are equivalent to concentrations ranging from 0.86 mg/L – 2.2 mg/L at the facility design flow of 0.257 MGD. **Monthly average mass effluent limits in accordance with the following table are recommended for this discharge, which are currently effective, and no changes are recommended.**

**Total Phosphorus Effluent Limitations**

<b>Month</b>	<b>Monthly Total P WLA<sup>1</sup> (lbs/month)</b>	<b>Days Per Month</b>	<b>Monthly Ave Total P Effluent Limit<sup>2</sup> (lbs/day)</b>
Jan	<b>148.56</b>	31	<b>4.79</b>
Feb	<b>121.0</b>	28	<b>4.32</b>
March	<b>101.84</b>	31	<b>3.29</b>
April	<b>67.21</b>	30	<b>2.24</b>
May	<b>56.91</b>	31	<b>1.84</b>
June	<b>63.2</b>	30	<b>2.11</b>
July	<b>77.69</b>	31	<b>2.51</b>
Aug	<b>96.54</b>	31	<b>3.11</b>
Sept	<b>113.8</b>	30	<b>3.79</b>
Oct	<b>116.75</b>	31	<b>3.77</b>
Nov	<b>139.81</b>	30	<b>4.66</b>
Dec	<b>146.67</b>	31	<b>4.73</b>

Footnotes:

1- Rock River TMDL Appendix P. Monthly Total Phosphorus Allocations by Wastewater Treatment Facility (p. 147)

2- Monthly average Total P effluent limit (lbs/day) = monthly Total P WLA (lbs/month) ÷ days per month

**Point of Discharge Limits**

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some time in the future, the Department may adopt phosphorus criteria based on new studies focusing on limited aquatic life waters. The Guidance for Implementing Wisconsin’s Phosphorus Water Quality Standards for Point Source Discharges (2020) suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), because ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The discharge location of the wastewater from Sharon is classified as limited aquatic life downstream from the point of discharge downstream to the WWSF classification at the Rock/Walworth County line (approximately 1.7 miles downstream of the outfall).

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 Little Turtle Creek.

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 Little Turtle Creek

Qs = 100% of the 7-Q<sub>2</sub> of 0 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 = 0.257 MGD = 0.398 cfs

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

The effluent limit is set equal to criteria because the receiving water flow is equal to zero.

**Effluent Data**

The following table summarizes effluent total phosphorus monitoring data from 07/10/2020 – 11/26/2025. The mass effluent data is calculated in the memo using the influent flow rate rather than the effluent due to effluent flow meter error.

**Total Phosphorus Effluent Data**

	<b>Phosphorus mg/L</b>	<b>Phosphorus lbs/day</b>
1-day P <sub>99</sub>	8.46	7.41
4-day P <sub>99</sub>	4.57	4.04
30-day P <sub>99</sub>	2.38	2.23
Mean	1.47	1.47
Std	1.76	1.51
Sample size	261	261
Range	<0.045 - 9.7	0 – 10.7

The discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion and is currently operating the treatment facility to remove phosphorus and meet the WQBELs. Therefore, **the WQBELs are required to continue in the reissued permit per ss. NR 217.15 and 205.067(5), Wis. Adm. Code.**

**Limit Expression**

According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, the effluent limit of 0.075 mg/L may be expressed as a six-month average. If a concentration limitation expressed as a six-month average is included in the permit, a monthly average concentration limitation of 0.225 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit. The six-month average should be averaged during the months of May – October and November – April.

**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 an approved TMDL. **This final mass limit shall be 0.075 mg/L × 8.34 × 0.257 MGD = 0.161 lbs/day expressed as a six-month average.**

**PART 6 – TOTAL SUSPENDED SOLIDS**

The Rock River TMDL also has wasteload allocations (WLAs) for total suspended solids (TSS). For a

municipal facility the limits for TSS must be expressed as weekly and monthly averages. **The current permit includes a weekly average limit of 30 mg/L and a monthly average limit of 20 mg/L which are also recommended to continue in the reissued permit.**

**Weekly and monthly average mass effluent limits in accordance with the Rock River TMDL in the following table are recommended for this discharge, which are currently effective, and no changes are made.** Besides one temporary upset in April 2024, Sharon has been able to meet the effective TSS limits.

**Total Suspended Solids Effluent Limitations**

Month	Weekly Average TSS Limit (lbs/day)	Monthly Average TSS Limit (lbs/day)
January	58.2	41.3
February	63.5	45.0
March	58.2	41.3
April	63.9	45.3
May	58.2	41.3
June	63.9	45.3
July	58.2	41.3
August	58.2	41.3
September	63.9	45.3
October	58.2	41.3
November	63.9	45.3
December	58.2	41.3

**Effluent Data**

The following table summarizes effluent total suspended solids monitoring data from 07/01/2020 – 11/30/2025, for informational purposes. The mass effluent data is calculated in the memo using the influent flow rate rather than the effluent due to effluent flow meter error.

**Total Suspended Solids Effluent Data**

	TSS mg/L	TSS lbs/day
1-day P <sub>99</sub>	36.1	55.4
4-day P <sub>99</sub>	20.7	30.2
30-day P <sub>99</sub>	12.9	16.7
Mean*	9.47	11.1
Std	7.15	11.3
Sample size	839	839
Range	<2 – 58.8	0 – 109

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

**PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL**

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are

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

**Reasonable Potential**

Based on the available discharge temperature data from 01/01/2019 – 06/30/2020 shown below, the maximum daily effluent temperature reported was 58 °F; therefore, no reasonable potential for exceeding the daily maximum limit exists, and **no limits or monitoring are recommended.** The complete thermal table is shown in Attachment #4.

**Monthly Temperature Effluent Data & Limits**

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	56	57	-	86
FEB	55	56	-	86
MAR	56	56	-	86
APR	57	58	-	86
MAY	56	57	-	86
JUN	56	57	-	86
JUL	57	57	-	86
AUG	56	56	-	86
SEP	55	56	-	86
OCT	55	56	-	86
NOV	55	56	-	86
DEC	56	56	-	86

**PART 8 – 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

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exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC<sub>50</sub> (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<sub>25</sub> (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 **100%** 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:

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

Where:

- Q<sub>e</sub> = annual average flow = 0.257 MGD = 0.398 cfs
- f = fraction of the Q<sub>e</sub> withdrawn from the receiving water = 0
- Q<sub>s</sub> = ¼ of the 7-Q<sub>10</sub> = 0 cfs ÷ 4 = 0 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. Data collected prior to July 1, 2005 is excluded in this evaluation.

**WET Data History**

Date Test Initiated	Acute Results LC <sub>50</sub> %				Chronic Results IC <sub>25</sub> %					Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Algae (IC <sub>50</sub> )	Pass or Fail?	Use in RP?	
02/09/2006					>100	>100		Pass	No	1
08/02/2007					>100	>100		Pass	No	1
05/01/2008					>100	>100		Pass	No	1
03/24/2012					>100	>100		Pass	No	1
09/20/2012					>100	>100		Pass	No	1
06/18/2013					77.5	>100		Fail	No	1
12/01/2015					>100	>100		Pass	No	1

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Date Test Initiated	Acute Results LC <sub>50</sub> %				Chronic Results IC <sub>25</sub> %					Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Algae (IC <sub>50</sub> )	Pass or Fail?	Use in RP?	
02/16/2016					>100	>100		Pass	No	1
06/06/2017					>100	92.5		Fail	No	1
07/18/2017					>100	>100		Pass	No	1
08/01/2017					>100	>100		Pass	No	1
12/11/2018					>100	>100		Pass	No	1
10/29/2019					>100	>100		Pass	No	1
02/11/2020					>100	>100		Pass	No	1
11/10/2020					85.1	>100		Fail	No	1
01/26/2021					83.7	>100		Fail	No	1
09/14/2021					71.6	27.3		Fail	No	1
06/20/2023					>100	>100		Pass	No	1
08/01/2023	>100	>100	Pass	Yes	>100	>100		Pass	No	1
09/26/2023					91.8	>100		Fail	No	1
01/09/2024					>100	>100		Pass	No	1
02/13/2024					>100	>100		Pass	No	1

Footnotes:

1. *Data Not Representative.* Significant changes are currently being constructed at the plant including a new tertiary filtration system which will be fully functional spring 2026. The upgrade is expected to help remove toxicity further.

The current permit has a chronic WET limit of 1.0 TUc. Although the past data likely will not be representative of the level of treatment that the upgrade will provide, the limit shall remain in the reissued permit due to antidegradation and antibacksliding purposes per ch. NR 207, Wis. Adm. Code.

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
<b>AMZ/IWC</b>	Not Applicable. <b>0 Points</b>	IWC = 100%. <b>15 Points</b>
<b>Historical Data</b>	1 test used to calculate RP. No tests failed. <b>0 Points</b>	21 tests used to calculate RP. 6 tests failed. <b>0 Points</b>

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	<b>Acute</b>	<b>Chronic</b>
<b>Effluent Variability</b>	Little variability, no violations or upsets, consistent WWTF operations. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Receiving Water Classification</b>	LAL classification with less than 4 miles to the nearest non-variance water. <b>5 Points</b>	Same as Acute. <b>5 Points</b>
<b>Chemical-Specific Data</b>	No reasonable potential for limits based on ATC; Ammonia nitrogen limit carried over from the current permit. Copper, chloride, and ammonia detected. Additional Compounds of Concern: None. <b>3 Points</b>	No reasonable potential for limits based on CTC; Ammonia nitrogen limit carried over from the current permit. Copper, chloride, and ammonia detected. Additional Compounds of Concern: None. <b>3 Points</b>
<b>Additives</b>	0 Biocides and 1 Water Quality Conditioner added. Permittee has proper P chemical SOPs in place. <b>1 Point</b>	All additives used more than once per 4 days. <b>1 Point</b>
<b>Discharge Category</b>	No Industrial Contributors. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Wastewater Treatment</b>	Secondary or better. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Downstream Impacts</b>	No impacts known. <b>0 Points</b>	Same as Acute. <b>0 Points</b>
<b>Total Checklist Points:</b>	<b>14 Points</b>	<b>29 Points</b>
<b>Recommended Monitoring Frequency (from Checklist):</b>	No tests required.	2x/year for the first two years, annually for the rest of the permit term.
<b>Limit Required?</b>	No	Yes Limit = 1.0 TU <sub>c</sub>
<b>TRE Recommended? (from Checklist)</b>	No	No

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, no acute tests are recommended. Chronic tests are recommended 2x/yearly for the first two years of the reissued permit to ensure that the upgraded facility will remove toxicity more efficiently. After the first year, 1x yearly chronic WET tests are recommended. 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. Testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, a chronic WET limit is required. The chronic WET limit shall be expressed as 1.0 TU<sub>c</sub> as a monthly average in the effluent limits table of the permit. The WET limit is currently effective and shall continue although the available data is not considered representative due to antidegradation and antibacksliding purposes

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per ch. NR 207, Wis. Adm. Code.

- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.

# Sharon WWTF Outfall Location



**Legend:** (Symbol) (Symbol) (Symbol) may not be displayed)

- ▲ Surface Water Outfalls
- 24K Streams and Rivers
- Latest Leaf Off Imagery
  - Red: Band\_1
  - Green: Band\_2
  - Blue: Band\_3

**Notes:**  
Not to scale



Map projection: NAD 1983 HARN Wisconsin TM  
Service Layer Credits: Basic Basemap (Cachect): Latest Leaf Off Imagery (Cachect):  
Map: 0 3,000 6,000 Feet  
0 1,000 2,000 Meters  
This map is a product generated by a DNR web mapping application.  
This map is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. The user is solely responsible for verifying the accuracy of information before using for any purpose. By using this product for any purpose user agrees to be bound by all disclaimers found here: <https://dnr.wisconsin.gov/disclaimer>  
Date Printed: 1/28/2025 3:35 PM

**2009 Ammonia Limits Calculations**

**Daily Maximum Limits based on Acute Toxicity Criteria (ATC):** Daily maximum limitations are based on acute toxicity criteria, which are a function of the effluent pH and the receiving water classification. The acute toxicity criterion (ATC) for ammonia is calculated using the following equation.

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

Where: A = 0.633 and B = 90.0 for Limited Aquatic Life; or

A = 0.411 and B = 58.4 for Limited Forage Fishery or Warm Water

Fishery

pH (su) = that characteristic of the effluent.

The daily maximum ammonia limitation is equal to 2 x the criterion.

**Weekly Average & Monthly Average Limits based on Chronic Toxicity Criteria (CTC):** Weekly average and monthly average limits for Ammonia Nitrogen are based on chronic toxicity criteria. The 30-day chronic toxicity criterion (CTC) for ammonia is calculated by the following equation, according to the listed classification:

$$\text{CTC} = E \times \{ [0.0676 \div (1 + 10^{(7.688 - \text{pH})})] + [2.912 \div (1 + 10^{(\text{pH} - 7.688)})] \} \times C$$

Where: pH = the pH (su) of the receiving water,

For Limited Aquatic Life:

$$E = 1,$$

$$C = (8.09 \times 10^{(0.028 \times (25 - T))})$$

T = Temperature of the receiving water in degrees Celsius;

For Limited Forage Fishery:

$$E = 1$$

C = the minimum of 3.09 or  $3.73 \times 10^{(0.028 \times (25 - T))}$  for Early Life Stages Present, or

C =  $3.73 \times 10^{(0.028 \times (25 - T))}$  for Early Life Stages Absent, and

T = the temperature (°C) of the receiving water for Early Life Stages

Present, or

T = the maximum of the actual temperature (°C) and 7 for Early Life Stages Absent

For Warm Water Fishery:

$$E = 0.854$$

C = the minimum of 2.85 or  $1.45 \times 10^{(0.028 \times (25 - T))}$  for Early Life Stages Present, or

C =  $1.45 \times 10^{(0.028 \times (25 - T))}$  for Early Life Stages Absent, and

T = the temperature (°C) of the receiving water for Early Life Stages

Present, or

T = the maximum of the actual temperature (°C) and 7 for Early Life Stages Absent

The 4-Day criterion is simply equal to the 30-Day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q<sub>10</sub> (4-Q<sub>3</sub>, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q<sub>5</sub> (estimated as 85% of the 7-Q<sub>2</sub> if the 30-Q<sub>5</sub> is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature. 100% of

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the flow is used if the Temperature  $\geq 16$  °C. Only 25% of the flow is used if the Temperature  $< 11$  °C. And 50% of the flow is used if the Temperature  $\geq 11$  °C but  $< 16$  °C.

The rules provide a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 °C, during the winter and spring months. Burbot, an early spawning species, are not believed to be present in the Manitowoc River system, based on conversations with local fisheries biologists. So “ELS Absent” criteria apply from October through March, and “ELS Present” criteria will apply from April through September.

**Background Parameters for Ammonia Limit Determinations:** For the daily maximum ammonia limit, ch. NR 106.32(4)(b)1 specifies that the daily maximum effluent pH be used. Since effluent pH is monitored daily, it is reasonable that there would be some ‘outliers’ in the course of several years of monitoring that are not representative of the maximum effluent pH. A ‘maximum’ pH of 7.7 s.u., which is the upper 99<sup>th</sup> percentile of pH data from January of 2004 through October of 2008, is used for determination of the daily maximum limit.

The background parameters for chronic (weekly and monthly) ammonia limitations are stream temperature, pH and background ammonia. There are no specific data for these parameters at the location of the outfall, but the table below provides typical representative background data for the corresponding seasons (months):

<b>Background Parameters</b>			
<b>Month(s)</b>	<b>River pH (s.u.)</b>	<b>River Temperature (degrees C)</b>	<b>Background Ammonia (mg/l)</b>
April	7.97	9	0.09
May-Sept	8.21	23	0.07
Oct	7.97	9	0.09
Nov-March	7.97	3	0.17

**Calculated Ammonia Limitations for All Classifications:**

For Limited Aquatic Life:

<b>Table 1: Calculated Ammonia Limits Based on LAL Classification</b>				
	<b>Month(s)</b>			
<b>Limit Type</b>	April	May-Sept	October	November-March
Daily Maximum	44 mg/l*	44 mg/l*	44 mg/l*	44 mg/l*
Weekly Average	59 mg/l*	17 mg/l	59 mg/l*	87 mg/l*
Monthly Average	24 mg/l	6.7 mg/l	24 mg/l*	35 mg/l*

For Limited Forage Fishery:

	Month(s)			
Limit Type	April	May-Sept	October	November-March
Daily Maximum	29 mg/l	29 mg/l*	29 mg/l*	29 mg/l
Weekly Average	8.1 mg/l	5.6 mg/l	27 mg/l*	31 mg/l
Monthly Average	3.2 mg/l	3.1 mg/l	11 mg/l	12 mg/l

For Warm Water Fishery:

	Month(s)			
Limit Type	April	May-Sept	October	November-March
Daily Maximum	29 mg/l	29 mg/l*	29 mg/l*	29 mg/l
Weekly Average	6.4 mg/l	2.2 mg/l	9.1 mg/l	10 mg/l
Monthly Average	2.5 mg/l	0.9 mg/l	3.6 mg/l	4.1 mg/l

A Note on limits for all classifications: ch. NR 106.33(2) specifies that for a publicly owned treatment works treating primarily domestic waste, limits greater than 20 mg/l for the months of May through October, and greater than 40 mg/l for the months of November through April, would not apply. Therefore, the calculated limits in the tables above that are marked with an asterisk would not apply.

**Are Limits Needed?:** The need for ammonia limitations are determined in accordance with the procedures in ch. NR 106.05. Specifically, the upper 99th percentile of the one day, four day average, and 30 day average effluent concentrations (P99s) are respectively compared to the daily maximum, weekly average, and monthly average limits. If any of the P99s are greater than the corresponding calculated limit, then ammonia limits are needed. Based on ammonia data from the term of Sharon's current permit, the P99s are:

1-day P99 = 24 mg/l  
 4-day P99 = 13.9 mg/l  
 30-day P99 = 5.8 mg/l

The 4-day P99 is greater than the corresponding weekly limits for April through September for the limited forage fishery classification, and greater than all weekly limitations for the warm water classification. The 30-day P99 is greater than the calculated monthly limits for April through September for the limited forage fishery classification, and greater than all monthly limitations for the warm water classification. Therefore, ammonia limitations are needed for the Sharon wastewater plant.

#### **Proposed Limits:**

The proposed WPDES permit for the Village of Sharon will be reissued on or about April 1<sup>st</sup>, 2009. There are other issues for the sewerage system that the Village will need to continue to address, one of which is reduction of clear water into the collection system. The design capacity of significant wastewater

Attachment #3

plant improvements, is related to projected flows; therefore, it seems prudent to prioritize sewer system evaluation and collection system assessments over significant wastewater plant upgrades.

Ch. NR 106.37 specifies a maximum compliance schedule of five years to meet an ammonia limit.

**With these factors in mind, as well as the discussions given above, I would propose permit limits consistent with the protection of the Limited Forage Fishery classification (Table 2, above), and a compliance schedule of as much as five years if other compliance schedules for sewer system improvements or assessments are also included in the permit. However, any wastewater plant improvements should be designed to meet ammonia limits consistent with the warm water classification (Table 3, above).**

### Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

<b>Facility:</b>	Sharon WWTF	<b>7-Q10:</b>	0.00 cfs	<b>Temp Dates</b>	<b>Flow Dates</b>
<b>Outfall(s):</b>	001	<b>Dilution:</b>	25%	<b>Start:</b>	01/01/2019
<b>Date Prepared:</b>	1/28/2025	<b>f:</b>	0	<b>End:</b>	06/30/2020
<b>Design Flow (Qe):</b>	0.26 MGD	<b>Stream type:</b>			12/31/24
<b>Storm Sewer Dist.</b>	0 ft	<b>Qs:Qe ratio:</b>	0.0 :1		

**Calculation Needed?** YES

Month	Water Quality Criteria		Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe)		Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default) (°F)	Sub-Lethal WQC (°F)		7-day Rolling Average (Qesl) (MGD)	Daily Maximum Flow Rate (Qea) (MGD)	Weekly Average (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	33	49	0.00	0.184	0.297	56	57	49	76
FEB	34	50	0.00	0.486	1.050	55	56	50	76
MAR	38	52	0.00	0.558	0.761	56	56	52	77
APR	48	55	0.00	0.624	0.930	57	58	55	79
MAY	58	65	0.00	0.378	0.458	56	57	65	82
JUN	66	76	0.00	0.192	0.230	56	57	76	84
JUL	69	81	0.00	0.193	0.446	57	57	81	85
AUG	67	81	0.00	0.175	0.292	56	56	81	84
SEP	60	73	0.00	0.376	0.779	55	56	73	82
OCT	50	61	0.00	0.146	0.260	55	56	61	80
NOV	40	49	0.00	0.142	0.162	55	56	49	77
DEC	35	49	0.00	0.171	0.564	56	56	49	76