

# Permit Fact Sheet

## General Information

Permit Number	WI-0021032-10-0
Permittee Name and Address	City of Ripon 100 Jackson St, Ripon, WI 54971
Permitted Facility Name and Address	Ripon Wastewater Treatment Facility 560 Aspen Street, Ripon, Wisconsin
Permit Term	July 01, 2026 to June 30, 2031
Discharge Location	South Bank of Silver Creek; Latitude 43.85501, Longitude 88.85688
Receiving Water	Silver Creek (WBIC 146800), in the Big Green Lake Watershed (UF07) of the Upper Fox River Basin, in Fond du Lac County
Stream Flow (Q <sub>7,10</sub> )	1.6 cfs
Stream Classification	Warm Water Sport Fish (WWSF) community, non-public water supply and recreational use
Discharge Type	Existing; Continuous
Annual Average Design Flow	1.8 MGD
Industrial or Commercial Contributors	5 industrial contributors: Ripon Pickle Co., Alliance Laundry Service, MSI Express Inc., AFK Foundry, and Signature Wafer
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

## Facility Description

This facility is an oxidation ditch facility that incorporates biological phosphorus removal. Raw wastewater is pumped up to a fine screening area and then to three anoxic zone mixing basins where it is blended with return activated sludge (RAS) from the final clarifiers. Wastewater then enters two oxidation ditches that are operated in parallel. Final clarifiers are next and those are followed by tertiary sand filters. The final effluent goes through UV disinfection prior to discharge. Waste activated sludge (WAS) is pumped to two aerated storage tank basins that were left over from the old treatment system. WAS is then sent to a gravity belt thickener. Thickened sludge is stored in a small concrete storage tank. Ripon has contracted out its sludge storage and land application needs. Urea may be added to the raw wastewater after screening, as needed, to provide the proper nutrient ratios.

## Substantial Compliance Determination

**Enforcement During Last Permit:** There have been no formal enforcement actions taken during the previous permit term. However, due to toxicity testing failures during the permit term, Ripon is currently working on a Toxicity Reduction Evaluation (TRE) and completing monthly toxicity testing. A few more tests will be done to confirm toxicity has been removed from the effluent. After this toxicity testing is complete and demonstrates that toxicity has been removed, the annual WET testing and chronic limit may become effective. See the Schedules section for more information on compliance dates.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and site visits on 12/3/24 and 1/30/26, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Mark Stanek, Wastewater Engineer on January 30, 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	1.31 MGD (Avg. 10/1/20-9/30/25)	Influent: Representative samples of the influent shall be collected from the automatic sampling device drawing samples after the screening process and prior to the addition of urea.
001	1.38 MGD (Avg. 10/1/20-9/30/25)	Effluent: Representative composite samples shall be collected from the automatic sampling device drawing samples after the tertiary filters and prior to the UV disinfection process. Representative grab samples shall be collected at the discharge end of the post-aeration tank.
002	1.4 MG (Hauled to another facility in 2025)	Cake Sludge: Representative samples of the aerobically digested Class B cake sludge shall be collected after the gravity belt thickener.
111	N/A – no flow monitoring required for field blanks	Field Blank: Collect a mercury field blank on the same day that mercury samples are collected at influent and effluent sampling points.

## Permit Requirements

### 1 Influent – Monitoring Requirements

#### 1.1 Sample Point Number: 701- Influent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Quarterly	24-Hr Flow Prop Comp	See the Mercury Monitoring permit section.

### 1.1.1 Changes from Previous Permit

Influent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

- The sample frequency for BOD<sub>5</sub> and TSS was decreased to 5/Week to match the required effluent sampling.
- The sample frequency for mercury monitoring was increased to quarterly.

### 1.1.2 Explanation of Limits and Monitoring Requirements

Monitoring of influent flow, BOD<sub>5</sub> 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. The mercury monitoring sample frequency was increased to quarterly because the data generation requirements specified in s. NR 106.145(3)(a)2., Wis. Adm. Code, require once every 3 months influent and effluent mercury monitoring for major municipal dischargers with an average flow rate greater than or equal to one million gallons per day but less than 5 million gallons per day.

## 2 In-plant - Monitoring and Limitations

### 2.1 Sample Point Number: 111- Field Blank

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Mercury, Total Recoverable		ng/L	Quarterly	Blank	See the Mercury Monitoring permit section.

### 2.1.1 Changes from Previous Permit

In-plant limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

- The sample frequency was increased to quarterly to match the influent and effluent sampling frequencies since field blanks are required to be collected at the same time as other mercury monitoring.

### 2.1.2 Explanation of Limits and Monitoring Requirements

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

## 3 Surface Water - Monitoring and Limitations

### 3.1 Sample Point Number: 001- Effluent

<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>
Flow Rate		MGD	Daily	Continuous	
BOD <sub>5</sub> , Total	Weekly Avg	mg/L	5/Week	24-Hr Flow Prop Comp	See BOD <sub>5</sub> Effluent Limitations table in the permit.
BOD <sub>5</sub> , Total	Monthly Avg	mg/L	5/Week	24-Hr Flow Prop Comp	See BOD <sub>5</sub> Effluent Limitations table in the permit.
BOD <sub>5</sub> , Total	Weekly Avg	lbs/day	5/Week	Calculated	See BOD <sub>5</sub> Effluent Limitations table in the permit.
Suspended Solids, Total	Weekly Avg	10 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	10 mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	324 lbs/day	5/Week	Calculated	
Suspended Solids, Total	Monthly Avg	224 lbs/day	5/Week	Calculated	
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of TSS and report on the last day of the month on the DMR. See TMDL Calculations permit section.
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 permit section.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Dissolved Oxygen	Daily Min	7.0 mg/L	5/Week	Grab	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonia (NH3-N) Total	Daily Max	12 mg/L	5/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	5.1 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective April-May.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	3.6 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective June-September.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	11 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective October-March.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.6 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective April-May.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.2 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective June-September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.1 mg/L	5/Week	24-Hr Flow Prop Comp	Limit effective October-March.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May-September.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May-September. See the E. coli Percent Limit permit section. Enter the result in the DMR on the last day of the month.
Chloride	Weekly Avg	580 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit. Sampling shall be conducted on four consecutive days one week per month. See the Chloride Variance - Implement Source Reduction Measures permit section and the Chloride SRM (Target Value) Schedule.
Chloride		lbs/day	4/Month	Calculated	Calculate the daily mass discharge of chloride in lbs/day on the same days chloride sampling occurs. $\text{Mass (lbs/day)} = \text{Concentration (mg/L)} \times \text{Flow (MGD)} \times 8.34$

<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>
Mercury, Total Recoverable		ng/L	Quarterly	Grab	See the Mercury Monitoring permit section.
Nickel, Total Recoverable		ug/L	Monthly	Grab	Monitoring only January-December 2029.
Beryllium, Total Recoverable		ug/L	Monthly	Grab	Monitoring only January-December 2029.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See the PFOS/PFOA Minimization Plan Determination of Need Schedule.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See the PFOS/PFOA Minimization Plan Determination of Need Schedule.
Phosphorus, Total	Monthly Avg	0.9 mg/L	5/Week	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	12 lbs/day	5/Week	Calculated	Calculate the daily mass discharge of phosphorus in lbs/day on the same days phosphorus sampling occurs. Mass (lbs/day) = Concentration (mg/L) x Flow (MGD) x 8.34
Phosphorus, Total	6-Month Avg	4.0 lbs/day	5/Week	Calculated	Calculate the daily mass discharge of phosphorus in lbs/day on the same days phosphorus sampling occurs. Mass (lbs/day) = Concentration (mg/L) x Flow (MGD) x 8.34
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 permit section.
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

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Calculations permit section.
Temperature Maximum		deg F	3/Week	Grab	See the Effluent Temperature Monitoring permit section.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual monitoring in rotating quarters. See the Whole Effluent Toxicity (WET) Testing permit section.
Chronic WET	Monthly Avg	1.1 TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual monitoring in rotating quarters. See the Whole Effluent Toxicity (WET) Testing permit section.

### 3.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

- Decreased the chloride variance interim effluent limit to 580 mg/L as a weekly average and updated source reduction measures throughout the permit term.
- Decreased the sample frequency for phosphorus, ammonia nitrogen, BOD<sub>5</sub>, TSS, pH and DO to 5/Week.
- Increased the sample frequency for mercury monitoring to quarterly.
- Addition of monthly monitoring for beryllium and nickel in calendar year 2029 to collect sufficient data needed to determine reasonable potential at the next permit reissuance.
- Addition of PFOS/PFOA monitoring at a frequency of every other month in accordance with s. NR 106.98(2), Wis. Adm. Code.
- Addition of a chronic WET monthly average limit, to become effective 9/1/26 (see also the Schedules section).

### 3.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo, by Nicole Krueger, Water Resources Engineer, dated 12/12/2025.

**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. The sample frequency for phosphorus, ammonia nitrogen, BOD<sub>5</sub>, TSS, pH and DO was decreased to 5/Week.

**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.

**Chloride** – The permittee has applied for a chloride variance, under the provisions of s. NR 106.83, Wis. Adm. Code, with its application for permit reissuance. The Department reviewed Ripon’s application for a chloride variance and the information supplied in the application supports the establishment of an interim effluent limit. The proposed permit includes an interim chloride limit of 580 mg/L (expressed as a weekly average), a target value of 522 mg/L (weekly avg), implementation of the chloride source reduction measures identified in the City of Ripon Chloride Source Reduction Measures Plan dated April 2025, and submittal of annual progress reports each year by January 31st. The Department concludes that Ripon is qualified for a variance from the water quality standard for chloride and proposes reissuance of this permit with the proposed variance.

**Mercury** – The sample frequency was increased to quarterly because the data generation requirements specified in s. NR 106.145(3)(a)2., Wis. Adm. Code, require once every 3 months influent and effluent mercury monitoring for major municipal dischargers with an average flow rate greater than or equal to one million gallons per day but less than 5 million gallons per day.

**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. Every other month monitoring is included in the permit in accordance with s. NR 106.98(2)(c), Wis. Adm. Code.

**Acute and Chronic WET** – Testing is required during the following quarters: October – December 2026; April – June 2027; July – September 2028; January – March 2029; and October – December 2030.

## 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	Cake	Fecal Coliform	Injection	Land Application	Approx. 316 (from permit application)
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>						
Is a priority pollutant scan required? <b>N/A</b>						

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

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	2/Year	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	2/Year	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	2/Year	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	2/Year	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	2/Year	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	2/Year	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	2/Year	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	2/Year	Composite	
Lead Dry Wt	High Quality	300 mg/kg	2/Year	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	2/Year	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	2/Year	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	2/Year	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	2/Year	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	2/Year	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	2/Year	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	2/Year	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	2/Year	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	2/Year	Composite	
Nitrogen, Total Kjeldahl		Percent	2/Year	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	2/Year	Composite	
Phosphorus, Total		Percent	2/Year	Composite	
Phosphorus, Water Extractable		% of Tot P	2/Year	Composite	
Potassium, Total Recoverable		Percent	2/Year	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Monitoring required in 2027. See Sludge Analysis for PCBs and the Standard Requirements permit section for Monitoring and Calculating PCB

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					Concentrations in Sludge.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Monitoring required in 2027. See Sludge Analysis for PCBs and the Standard Requirements permit section for Monitoring and Calculating PCB Concentrations in Sludge.
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.

#### 4.1.1 Changes from Previous Permit

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

- The year in which PCB monitoring is required has been updated to 2027.
- PFAS monitoring is required annually pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

#### 4.1.2 Explanation of Limits and Monitoring Requirements

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

**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 WET Toxicity Reduction Evaluation (TRE)

Required Action	Due Date
<b>Final Report:</b> Submit a final TRE report describing all actions taken to remove chronic toxicity and to achieve compliance with the chronic WET limit.	08/31/2026
<b>Limit Effective:</b> The chronic WET limit of 1.1 TUc as a monthly average becomes effective.	09/01/2026

#### 5.1.1 Explanation of Schedule

**WET Toxicity Reduction Evaluation (TRE)** – Ripon is currently working on a TRE and completing monthly toxicity testing. A few more tests are needed to confirm toxicity has been removed from the effluent. This schedule allows the permittee time to finish testing and generate a final report. After this toxicity testing is complete and demonstrates that toxicity has been removed, the annual WET testing and chronic limit will become effective. The chronic WET limit of 1.1 TUc (monthly avg) becomes effective on 9/1/26. The first annual WET test is scheduled for October-December 2026.

### 5.2 Chloride Source Reduction Measures (Target Value)

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
<p><b>Annual Chloride Progress Report:</b> Submit an annual chloride progress report related to the source reduction activities for the previous year. The annual chloride progress report shall:</p> <p>Indicate which chloride source reduction measures or activities in the Source Reduction Plan have been implemented and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why. Include an assessment of whether each implemented source reduction measure appears to be effective or ineffective at reducing pollutant discharge concentrations and identify actions planned for the upcoming year;</p> <p>Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and</p> <p>Include an analysis of how effluent chloride varies with time and with significant loadings of chloride. Note that the interim limitation listed in the Surface Water section of this permit remains enforceable until new enforceable limits are established in the next permit issuance.</p> <p>The first annual chloride progress report is to be submitted by the Date Due.</p>	01/31/2027
<b>Annual Chloride Progress Report #2:</b> Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2028
<b>Annual Chloride Progress Report #3:</b> Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2029
<b>Annual Chloride Progress Report #4:</b> Submit the chloride progress report, related to the source reduction activities for the previous year, as defined above.	01/31/2030
<b>Final Chloride Report:</b> Submit the final chloride report documenting the success in meeting the chloride target value of 522 mg/L (weekly avg), as well as the anticipated future reduction in chloride sources and chloride effluent concentrations.	12/31/2030

<p>The report shall:</p> <p>Summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the Source Reduction Plan were not pursued and why;</p> <p>Include an assessment of which source reduction measures appear to have been effective or ineffective. Evaluate any needed changes to the pollutant reduction strategy accordingly;</p> <p>Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data during the current permit term; and</p> <p>Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride as identified in the source reduction plan.</p> <p>If the permittee intends to reapply for a chloride variance, for the reissued permit, proposed target limits and a detailed source reduction measures plan, outlining the source reduction activities proposed for the upcoming permit term, shall also be included per ss. NR 106.90 (5) and NR 106.83 (4), Wis. Adm. Code. An updated source reduction measures plan shall:</p> <p>Include an explanation of why or how each source reduction measure will result in reduced discharge of the target pollutant; and</p> <p>Evaluate any available information on pollutant sources, timing, and concentration to update the mass balance assumptions and expected sources of the pollutant, and</p> <p>Identify any information needs that would help to better determine pollutant sources and make plans to collect that information.</p> <p>Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures but is not an enforceable limitation under the terms of this permit.</p>	
<p><b>Annual Chloride Reports After Permit Expiration:</b> In the event that this permit is not reissued by the date the permit expires the permittee shall continue to submit annual chloride reports for the previous year following the due date of Annual Chloride Progress Reports listed above. Annual Chloride Progress Reports shall include the information as defined above.</p>	

### 5.2.1 Explanation of Schedule

**Chloride Source Reduction Measures (Target Value)** – This schedule is required to ensure that the permittee maintains compliance with the conditions and requirements of receiving a variance from the water quality-based chloride effluent limit of 447 mg/L expressed as a weekly average. Since a compliance schedule is being granted, an interim limit is required, and that limit is established as 580 mg/L (as a weekly average). The schedule requires that annual reports shall indicate which source reduction measures have been implemented during each calendar year, and an analysis of chloride concentration and mass discharge data based on chloride sampling and flow data. The annual reports shall document progress made towards meeting the chloride target value of 522 mg/L (weekly avg) by the end of the permit term.

### 5.3 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
<p><b>Report on Effluent Discharge:</b> Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code.</p>	<p>06/30/2027</p>

<p>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.</p>	
<p><b>Report on Effluent Discharge and Evaluation of Need:</b> Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan.</p> <p>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.</p> <p>The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan.</p> <p>If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued.</p> <p>If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.</p>	<p>06/30/2028</p>

### 5.3.1 Explanation of Schedule

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

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

### 5.4 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
<p><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 landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.</p>	<p>06/30/2027</p>

### **5.4.1 Explanation of Schedule**

**Land Application Management Plan** – 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**

WQBEL memo: Water Quality-Based Effluent Limitations for Ripon Wastewater Treatment Facility WPDES Permit No. WI-0021032-10, by Nicole Krueger, Water Resources Engineer, dated 12/12/2025

Chloride Source Reduction Measures Plan, City of Ripon, April 2025

Chloride Variance EPA Data Sheet

### **Justification Of Any Waivers From Permit Application Requirements**

No waivers from permit application requirements were requested or granted as part of this permit reissuance.

**Prepared By:** Sarah Donoughe, Wastewater Specialist-Adv

**Date:** February 26, 2026

# CORRESPONDENCE/MEMORANDUM

DATE: 12/12/2025

TO: Sarah Donoughe – SER

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Ripon Wastewater Treatment Facility  
WPDES Permit No. WI-0021032-10

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 Ripon Wastewater Treatment Facility in Fond du Lac County. This municipal wastewater treatment facility (WWTF) discharges to Silver Creek, located in the Big Green Lake Watershed in the Upper Fox River Basin. This discharge is included in the Upper Fox/Wolf River Basin (UFWRB) Total Maximum Daily Load (TMDL) as approved by EPA on 02/27/2020.

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>			See Table	See Table		1,3,4
TSS TMDL			10 mg/L 324 lbs/day	<b>10 mg/L</b> 224 lbs/day		4,5
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		7.0 mg/L				1
Ammonia Nitrogen April – May June – September October – March	12 mg/L 12 mg/L 12 mg/L		5.1 mg/L 3.6 mg/L 11 mg/L	2.6 mg/L 2.2 mg/L 5.1 mg/L		1
<i>E. coli</i> May – September				126#/100 mL geometric mean		1,6
Chloride			447 mg/L			7
Mercury						1,2
Nickel						2
Beryllium						2
PFOS & PFOA						8
Phosphorus TMDL				0.9 mg/L 12 lbs/day	4.0 lbs/day	5
Temperature						1,2
TKN, Nitrite+Nitrate, and Total Nitrogen						9
Acute WET						10,11
Chronic WET				1.1 TUc		10,11

Footnotes:

1. No changes from the current permit.
2. Monitoring only.

3. The monthly BOD<sub>5</sub> limits are shown below:

Month	Weekly Average Concentration	Weekly Average Mass	Monthly Average Concentration
January	14 mg/L	224 lbs/day	<b>14 mg/L</b>
February	14 mg/L	222 lbs/day	<b>14 mg/L</b>
March	14 mg/L	228 lbs/day	<b>14 mg/L</b>
April	16 mg/L	253 lbs/day	<b>16 mg/L</b>
May	11 mg/L	157 lbs/day	<b>11 mg/L</b>
June	8.5 mg/L	129 lbs/day	<b>8.5 mg/L</b>
July	8.2 mg/L	120 lbs/day	<b>8.2 mg/L</b>
August	8.2 mg/L	123 lbs/day	<b>8.2 mg/L</b>
September	8.9 mg/L	131 lbs/day	<b>8.9 mg/L</b>
October	10 mg/L	152 lbs/day	<b>10 mg/L</b>
November	14 mg/L	227 lbs/day	<b>14 mg/L</b>
December	14 mg/L	229 lbs/day	<b>14 mg/L</b>

4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Upper Fox/Wolf River Basin (UFWRB) to address phosphorus water quality impairments within the TMDL area.
6. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
7. This is the WQBEL for chloride. An alternative effluent limitation of 580 mg/L (based on the 4-day P<sub>99</sub>) as a weekly average may be included in the permit in place of this limit if the chloride variance application that was submitted is approved by EPA.
8. PFOS and PFOA monitoring is recommended at a frequency of once every two months in accordance with s. NR 106.98(2), Wis. Adm. Code.
9. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all municipal major permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. 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).
10. Annual acute and chronic WET testing is recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 87%. 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 Silver Creek.
11. 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, Map, 2019 Ammonia Limits Calculations, Thermal Limits Table

PREPARED BY: Nicole Krueger, Water Resources Engineer

E-cc: Mark Stanek, Wastewater Engineer – NER  
Heidi Schmitt Marquez, Regional Wastewater Supervisor – NER  
Diane Figiel, Water Resources Engineer – WY/3  
Nate Willis, Wastewater Engineer – WY/3

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

**WPDES Permit No. WI-0021032-10**

Prepared by: Nicole Krueger

**PART 1 – BACKGROUND INFORMATION**

**Facility Description**

This facility is an oxidation ditch facility that incorporates biological phosphorus removal. Raw wastewater is pumped up to a fine screening area and then to three anoxic zone mixing basins where it is blended with return activated sludge (RAS) from the final clarifiers. Wastewater then enters two oxidation ditches that are operated in parallel. Final clarifiers are next and those are followed by tertiary sand filters. The final effluent goes through UV disinfection prior to discharge. Waste activated sludge (WAS) is pumped to two aerated storage tank basins that were left over from the old treatment system. WAS is then sent to a gravity belt thickener. Thickened sludge is stored in a small concrete storage tank. Ripon has contracted out its sludge storage and land application needs. Urea may be added to the raw wastewater after screening, as needed to provide the proper nutrient ratios.

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

**Existing Permit Limitations**

The current permit, which expired on September 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
BOD <sub>5</sub>			See Table	See Table		2,3,4
TSS TMDL			10 mg/L 324 lbs/day	<b>10 mg/L</b> 224 lbs/day		4,5
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		7.0 mg/L				2
Ammonia Nitrogen April – May June – September October – March	12 mg/L 12 mg/L 12 mg/L		5.1 mg/L 3.6 mg/L 11 mg/L	2.6 mg/L 2.2 mg/L 5.1 mg/L		
<i>E. coli</i> May – September				126#/100 mL geometric mean		6
Chloride			663 mg/L			7
Mercury						1
Phosphorus TMDL				0.9 mg/L 12 lbs/day	4.0 lbs/day	5
Temperature						1

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
TKN, Nitrite+Nitrate, and Total Nitrogen						1
Acute WET						8
Chronic WET						8

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. The monthly BOD<sub>5</sub> limits are shown below:

Month	Weekly Average Concentration	Weekly Average Mass	Monthly Average Concentration
January	14 mg/L	224 lbs/day	<b>14 mg/L</b>
February	14 mg/L	222 lbs/day	<b>14 mg/L</b>
March	14 mg/L	228 lbs/day	<b>14 mg/L</b>
April	16 mg/L	253 lbs/day	<b>16 mg/L</b>
May	11 mg/L	157 lbs/day	<b>11 mg/L</b>
June	8.5 mg/L	129 lbs/day	<b>8.5 mg/L</b>
July	8.2 mg/L	120 lbs/day	<b>8.2 mg/L</b>
August	8.2 mg/L	123 lbs/day	<b>8.2 mg/L</b>
September	8.9 mg/L	131 lbs/day	<b>8.9 mg/L</b>
October	10 mg/L	152 lbs/day	<b>10 mg/L</b>
November	14 mg/L	227 lbs/day	<b>14 mg/L</b>
December	14 mg/L	229 lbs/day	<b>14 mg/L</b>

4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. The mass TSS and phosphorus limits are based on wasteload allocations from the Upper Fox Wolf TMDL.
6. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
7. This is a variance interim limit.
8. Annual acute and chronic WET testing is required in the current permit. The IWC for chronic WET was 87%.

**Receiving Water Information**

- Name: Silver Creek
- Waterbody Identification Code (WBIC): 146800
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply and recreational use. 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<sub>10</sub> and

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7-Q<sub>2</sub> values are from USGS for Station UF25, where Outfall 001 is located.

7-Q<sub>10</sub> = 1.6 cubic feet per second (cfs)

7-Q<sub>2</sub> = 3.2 cfs

90-Q<sub>10</sub> = 3.06 cfs

Harmonic Mean Flow = 6.7 cfs

The Harmonic Mean has been estimated based on average flow and the 7-Q<sub>10</sub> using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7-Q <sub>10</sub> (cfs)	3.2	3.2	4.0	7.2	4.8	3.3	2.7	2.8	2.8	3.4	4.2	3.7
7-Q <sub>2</sub> (cfs)	4.8	4.8	7.1	12	8.1	6.0	4.5	4.1	4.4	5.1	6.3	5.7

- Hardness = 340 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean of data from 02/04/2021 – 06/17/2025.
- % 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 Silver Creek (Station ID 10010820 at Ripon Public Library) 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: None.
- Impaired water status: Silver Creek is impaired for phosphorus and TSS at the point of discharge.

**Effluent Information**

- Design flow rate(s):
  - Annual average = 1.8 million gallons per day (MGD)
  - Peak daily = 3.2 MGD
  - Peak weekly = 2.7 MGD
  - Peak monthly = 2.5 MGD
- For reference, the actual average flow from 09/01/2020 – 10/31/2025 was 1.38 MGD.
- Hardness = 456 mg/L as CaCO<sub>3</sub>. This value represents the geometric mean from April to May 2024 which were reported on 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).
- Wastewater source: Domestic wastewater with 5 industrial contributors: Ripon Pickle Co., Alliance Laundry Service, MSI Express, Inc., AFK Foundry, and Signature Wafer.
- Water supply: Municipality waterworks and private wells.
- Additives: Ripon has included 1 additive in the permit application that have the potential to be present in Outfall 001. These additives are listed below:
  - Hawkins Aluminum Sulfate – Phosphorus removal
  - An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. This is the case upon initial review of the aluminum sulfate.
- Effluent characterization: This facility is categorized as a major municipal, so the permit application

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required effluent sample analyses for all the “priority pollutants” except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code.

- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, 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.

**Copper Effluent Data**

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
04/16/2024	16	04/28/2024	15	05/14/2024	445
04/19/2024	17	05/01/2024	17	05/17/2024	17
04/22/2024	15	05/07/2024	15	05/27/2024	15
04/25/2024	36	05/10/2024	16		
1-day P <sub>99</sub> = 527 µg/L					
4-day P <sub>99</sub> = 312 µg/L					

**Chloride Effluent Data**

	Concentration (mg/L)
1-day P <sub>99</sub>	699
4-day P <sub>99</sub>	576
30-day P <sub>99</sub>	507
Mean	470
Std	83.8
Sample size	245
Range	299 - 792

**Mercury Effluent Data**

	Concentration (ng/L)
1-day P <sub>99</sub>	2.05
4-day P <sub>99</sub>	1.17
30-day P <sub>99</sub>	0.66
Mean*	0.45
Std	0.43
Sample size	15
Range	<0.36 - 1.6

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

The following table presents the average concentrations and loadings at Outfall 001 from 09/01/2020 – 10/31/2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

**Parameters with Effluent Limits**

	Average Measurement	Average Mass Discharged
BOD <sub>5</sub>	0.54 mg/L*	
TSS	0.67 mg/L*	5.05 lbs/day
pH field	7.5 s.u.	

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	Average Measurement	Average Mass Discharged
Dissolved Oxygen	9.7 mg/L	
Ammonia Nitrogen	0.09 mg/L*	
<i>E. coli</i>	96 #/100 mL**	
Phosphorus	0.30 mg/L*	3.58 lbs/day
Chloride	470 mg/L	

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

\*\* The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the geometric mean.

**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. Adm. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-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.

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

Where:

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

Q<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.

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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 Ripon.

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) and mercury (ng/L).

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

RECEIVING WATER FLOW = 1.28 cfs, (1-Q<sub>10</sub> (estimated as 80% of 7-Q<sub>10</sub>)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P <sub>99</sub>	1-day MAX. CONC.
Arsenic		340		496	99.2	<14		
Cadmium	456	58.7		85.7	17.1	0.3		
Chromium	301	4446		6489	1298	<1.3		
Copper	456	65.0		94.8			<b>527</b>	
Lead	356	365	3	531	106	<3.5		
Mercury (ng/L)		830		1211	242		2.05	1.6
Nickel	268	1080	0.5	1577	315	48		
Zinc	333	345		503	101	27		
Chloride (mg/L)		757	33.8	1089			699	792

\* 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 = 0.4 cfs (¼ of the 7-Q<sub>10</sub>), 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 <sub>99</sub>
Arsenic		152		174	34.8	<14	
Cadmium	175	3.82		4.37	0.9	0.30	
Chromium	301	326		373	74.5	<1.3	
Copper	340	29.5		33.7			<b>312</b>
Lead	340	91.4	3	104	20.8	<3.5	
Mercury (ng/L)		440		503	100.6		
Nickel	268	120	0.5	137	27.5	<b>48</b>	
Zinc	333	345		394	78.8	27	
Chloride (mg/L)		395	33.8	447			<b>576</b>

\* 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.

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

RECEIVING WATER FLOW = 0.77 cfs (¼ of the 90-Q<sub>10</sub>), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P <sub>99</sub>
Mercury (ng/L)	1.3		1.3			0.66

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

RECEIVING WATER FLOW = 1.675 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P <sub>99</sub>
Antimony	373		597	119.5	8.8	
Cadmium	370		593	118.5	0.3	
Chromium (+3)	3818000		6114214	1222843	<1.3	
Lead	140	3	222	44.5	<3.5	
Mercury (ng/L)	1.5		1.5			0.66
Nickel	43000	0.5	68861	13772	48	
Silver	28000		44840	8968	0.6	
Isophorone	180000		288255	57651	12	

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

RECEIVING WATER FLOW = 1.675 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		21.3	4.26	<14
Beryllium	0.33		0.53	0.106	<b>0.30</b>

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

**Conclusions and Recommendations**

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for chloride. Limits and/or monitoring recommendations are made in the paragraphs below:

Arsenic – Considering available effluent data from the permit application of <14 µg/L using the EPA 200.7 analytical method. The limit of detection of this analytical method is higher than 1/5<sup>th</sup> of the calculated limit (21.3 µg/L based on HCC). **A more sensitive approved analytical method is recommended for future arsenic samples such that the limit of detection is less than or equal to 4.26 µg/L to better determine the need for arsenic limits at the next permit reissuance per s. NR 200.027(1), Wis. Adm. Code.**

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Copper – Considering available effluent data from the permit reissuance application, the 1-day P<sub>99</sub> copper concentration is 527 µg/L, and the 4-day P<sub>99</sub> of effluent data is 312 µg/L. These are both above the respective daily maximum and weekly average limits based on ATC and CTC. However, the data that was reported on 05/14/2024 as 445 µg/L is likely in error because it is significantly greater than all other copper samples reported during this time. This result is not representative of normal conditions. Copper samples from the most recent two permit reissuance applications are summarized below:

**Copper Effluent Data**

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
12/18/2018	23	01/10/2019	14	05/01/2024	17
12/21/2018	33	01/13/2019	13	05/07/2024	15
12/24/2018	21	01/16/2019	20	05/10/2024	16
12/27/2018	30	04/16/2024	16	05/14/2024	445
12/30/2018	34	04/19/2024	17	05/17/2024	17
01/02/2019	26	04/22/2024	15	05/27/2024	15
01/05/2019	30	04/25/2024	36		
01/07/2019	28	04/28/2024	15		

The 1-day and 4-day P<sub>99</sub> for copper results using the data from 12/18/2018 – 05/27/2024 and excluding the result from 05/14/2024 are 44.7 µg/L and 31.7 µg/L, respectively. These are below the calculated daily maximum and weekly average limits. Therefore, **no copper limits or monitoring is recommended in the reissued permit.**

Nickel – The single available effluent data from the permit application of 48 µg/L is greater than 1/5<sup>th</sup> of the most stringent calculated limit of 137 µg/L based on CTC. Data from previous permit applications is summarized below:

**Effluent Nickel Data**

	Concentration (µg/L)
09/09/2008	13
12/18/2018	10
05/27/2024	48
Average	24

The average of all 3 data points is 24 ug/L which is less than 1/5<sup>th</sup> of the most stringent limit so there is not reasonable potential. However, **it is recommended that the reissued permit include nickel monitoring to have sufficient data to determine reasonable potential in the next reissuance.**

Beryllium – The single available effluent data from the permit application of 0.3 µg/L is greater than 1/5<sup>th</sup> of the most stringent calculated limit of 0.53 µg/L based on HCC. Data from previous permit applications is summarized below:

**Effluent Beryllium Data**

	Concentration (µg/L)
10/02/2008	<0.1
12/18/2018	<0.1

Attachment #1

	Concentration (µg/L)
05/27/2024	0.3
Average	0.1

The average of all 3 data points is 0.1 ug/L which is less than 1/5<sup>th</sup> of the most stringent limit so there is not reasonable potential. However, **it is recommended that the reissued permit include beryllium monitoring to have sufficient data to determine reasonable potential in the next reissuance.**

Chloride – Considering available effluent data from the current permit term (10/05/2020 – 10/09/2025), the 1-day P<sub>99</sub> chloride concentration is 699 mg/L, and the 4-day P<sub>99</sub> of effluent data is 576 mg/L.

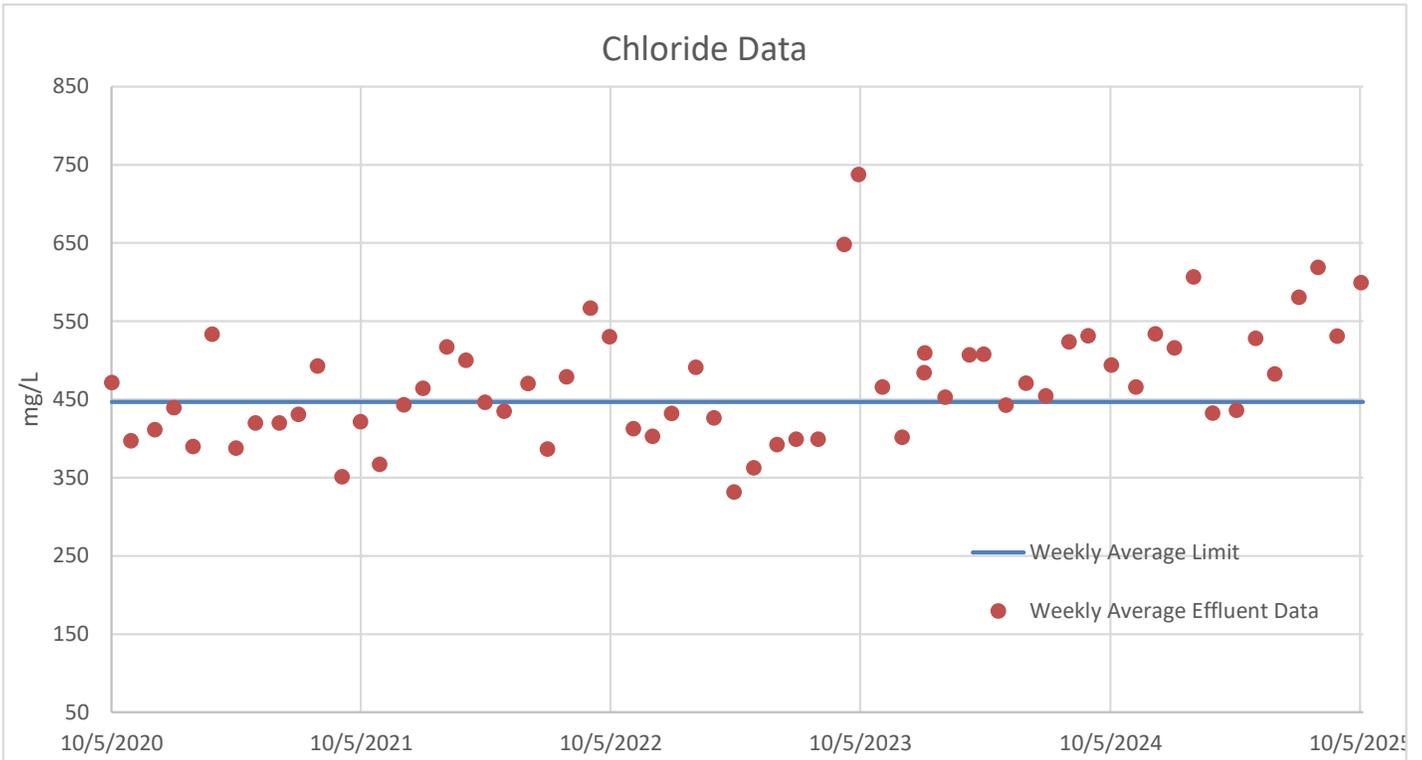
Because the 4-day P<sub>99</sub> exceeds the calculated weekly average WQBEL, an effluent limit is needed in accordance with s. NR 106.05(4)(b), Wis. Adm. Code.

However, Subchapter VII of ch. NR 106, Wis. Adm. Code, provides for a variance from water quality standards for this substance, and Ripon has requested such a variance. That variance may be granted subject to the following conditions:

- 1) The permit shall include an “Interim” limitation intended to prevent an increase in the discharge of Chloride;
- 2) The permit shall specify “Source Reduction Measures” to be implemented during the permit term, with periodic progress reports; and
- 3) The permit shall include a “Target Limit” or “Target Value” to gage the effectiveness of the Source Reduction Measures, and progress toward the WQBELs.

**Interim Limit for Chloride**

Section NR 106.82(9), Wis. Adm. Code, defines a “Weekly average interim limitation” as either the 4-day P<sub>99</sub> concentration or 105% of the highest weekly average concentration of the representative data. **It’s recommended that the 4-day P<sub>99</sub> of 580 mg/L be included in the reissued permit as the weekly average limit**, rounded to two significant figures. Ripon has implemented source reduction measures so the 4-day P<sub>99</sub> has decreased since the previous evaluation. Data from the current permit is shown below for informational purposes:



A target limit and permit language for Source Reduction Measures are not recommended as part of this evaluation. These should follow contact with Ripon. Though if the Department and Ripon are unable to reach agreement on all the terms of a Chloride Variance, the calculated limits described earlier should be included in the permit, in accordance with s. NR 106.83(3), Wis. Adm. Code.

**Chloride Monitoring Recommendations**

Four samples per month (on consecutive days) are recommended. This allows for averaging of the results to compare with the interim limit and allows the use of the average in determining future interim limits, and degree of success with chloride reduction measures.

**In the absence of a variance**, Ripon would be subject to the QBEL of 447 mg/L as a weekly average; the weekly average mass limit of 6,700 lbs/day ( $447 \text{ mg/L} \times 1.8 \text{ MGD} \times 8.34$ ); and an alternative wet weather mass limit. The wet weather mass limit applies when the dry weather mass limit is exceeded, and the facility demonstrates to the Department the exceedance occurred during a wet weather event.

Mercury – The QBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

The current permit requires 3/year monitoring of the influent and effluent for total recoverable mercury. A total of 15 effluent sampling results are available from 12/08/2020 – 10/10/2025 for total recoverable mercury. The average concentration was 0.45 ng/L, and the maximum was 1.6 ng/L. Because the 30-day  $P_{99}$  of available data (0.66 ng/L) is less than the most stringent QBEL of 1.3 ng/L, **no QBEL for**

**mercury is required for permit reissuance. Mercury monitoring is recommended to continue in the reissued permit.**

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 effluent flow rate and the types of indirect dischargers contributing to the collection system, **PFOS and PFOA monitoring is recommended at a once every two months frequency.**

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

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. 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:

- The maximum expected effluent pH has changed

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

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

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

Where:

A = 0.411 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 1887 sample results were reported from 09/02/2020 – 10/31/2025. The maximum reported value was 8.1 s.u. (Standard pH Units). The effluent pH was 7.9 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 2.326, 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 = 10 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 calculated using 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**

	Ammonia Nitrogen Limit mg/L
--	--------------------------------

Attachment #1

2×ATC	20
1-Q <sub>10</sub>	15

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

This limit is greater than the current daily maximum limit of 12 mg/L. If Ripon 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 highest reported concentration was 14.7 mg/L, but this was due to urea being drained to the head of the plant too quickly and is not representative of normal conditions. This data is not included in the rest of this evaluation. The next highest reported concentration was 3.56 mg/L. Therefore, 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).

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

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

**Effluent Data**

The following table evaluates the statistics based upon ammonia data reported from 09/06/2020 – 10/29/2025.

**Ammonia Nitrogen Effluent Data**

Ammonia Nitrogen mg/L	April - May	June - September	October - March
1-day P <sub>99</sub>	1.66	0.51	1.80
4-day P <sub>99</sub>	0.89	0.30	0.94
30-day P <sub>99</sub>	0.37	0.12	0.39
Mean*	0.11	0.02	0.11
Std	0.68	0.42	0.79
Sample size	304	639	940
Range	<0.049 - 3.17	<0.049 - 1.87	<0.049 - 3.56

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

**Reasonable Potential**

The need to include ammonia limits in Ripon’s permit is determined by calculating 99<sup>th</sup> upper percentile (or P<sub>99</sub>) values for ammonia year-round and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. However, since the permit currently has weekly and monthly average limits year-round, **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.

**Final Ammonia Nitrogen Limits**

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
April & May	12	5.1	2.6
June – September	12	3.6	2.2
October – March	12	11	5.1

**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.

**Since Ripon has phosphorus limits in effect that are more stringent than 1.0 mg/L, the need for a TBEL will not be considered further.**

**Total Maximum Daily Load**

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

The TP WLA for Ripon is 1,301 lbs/year. The TMDL-based limits for Ripon became effective in October 2021. The following table summarizes Ripon’s annual loading from the current permit term:

**Annual TP Loading**

Year	TP lbs/year
2021	514
2022	1043
2023	1932
2024	2184
2025 (through October)	850

Ripon is not currently meeting the annual WLA of 1,301 lbs/year, the **current TMDL-based limits of 12 lbs/day as a monthly average and 4.0 lbs/day as a six-month average**. Typically in this case, the department will review the monitoring frequency and potentially suggest an increase in monitoring. However, Ripon is currently monitoring daily which is the maximum frequency the department would require. Therefore, no changes are recommended to the phosphorus limits. **The current limits of 4.0 lbs/day as a six-month average and 12 lbs/day as a monthly average shall remain the same.**

Six-month average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to concentrations of 0.27 mg/L and 0.80 mg/L at the facility design flow of 1.8 MGD.

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

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

**Effluent Data**

The following table summarizes effluent total phosphorus monitoring data from 09/01/2020 – 10/31/2025.

**Total Phosphorus Effluent Data**

	<b>Concentration mg/L</b>	<b>Mass lbs/day</b>
1-day P <sub>99</sub>	1.53	18.7
4-day P <sub>99</sub>	0.83	10.2
30-day P <sub>99</sub>	0.46	5.51
Mean	0.30	3.58
Std	0.31	3.84
Sample size	1886	1886
Range	<0.045 - 4.041	0 – 42.2

**PART 6 – TOTAL SUSPENDED SOLIDS**

Total Suspended Solids (TSS) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (April 2020). This WLAs found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf Basins (UFW TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). The TSS WLA for Ripon is 54,835 lbs/year. The following table summarizes Ripon’s annual loading from the current permit term:

Attachment #1  
**Annual TSS Loading**

Year	TSS lbs/year
2021	7284
2022	10544
2023	8829
2024	3854
2025 (through October)	2877

Because Ripon is already meeting the annual WLA of 54,835 lbs/year, the **current TMDL-based limits of 324 lbs/day as a weekly average and 224 lbs/day as a monthly average are recommended to continue in the reissued permit.**

**PART 7 – 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 09/01/2020 – 10/31/2025.

The table below summarizes the maximum temperatures reported during monitoring from 10/01/2020 – 09/30/2025.

**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	52	53	56	91
FEB	52	53	56	90
MAR	53	55	57	86
APR	56	57	<b>58</b>	91
MAY	62	70	68	90
JUN	66	68	78	88
JUL	69	70	83	87
AUG	70	71	84	88

Attachment #1

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)
SEP	70	70	77	87
OCT	68	69	<b>64</b>	87
NOV	62	64	<b>53</b>	90
DEC	55	57	<b>55</b>	92

\* NA denotes “not applicable” when the calculated weekly average limit is greater than or equal to 120 °F.

**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

Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. The months in which limitations are recommended are shown in bold. Based on this analysis, weekly average temperature maximum limits are necessary for the months of April, October, November, and December. The thermal calculation table is in Attachment #4.

Ripon has submitted a request for consideration of dissipative cooling (DC). The DC study was originally submitted to the department in 2014 which showed the instream temperatures were below the sublethal criteria downstream of Outfall 001. Ripon has also verified that there has been no change to temperature loadings to the facility. Based on this information, the department has found that it is not necessary to include temperature limits in the reissued permit. **Temperature monitoring is recommended** per the requirements of s. NR 106.59(7), Wis. Adm. Code.

**Future WPDES Permit Reissuance**

DC requests must be re-evaluated every permit reissuance. The permittee is responsible for submitting an updated DC request prior to permit reissuance. Such a request must either include:

- a) A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or

- b) New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

**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 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 87%**, 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 = 1.8 MGD = 2.785 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> = 1.6 cfs ÷ 4 = 0.4 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.

Attachment #1

Data collected before 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	Pass or Fail?	Use in RP?	
03/23/2006	>100	>100	Pass	Yes	27.27	>100	Fail	Yes	
05/04/2006	>100	>100	Pass	Yes	66.67	>100	Fail	Yes	
06/15/2006	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
11/02/2006	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
09/13/2007	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
10/21/2008	>100	>100	Pass	Yes	>100	>100	Pass	No	1
10/04/2016	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
08/15/2017	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
04/03/2018	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
10/06/2020	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
02/04/2021	>100	>100	Pass	Yes	>100	95.8	Pass	Yes	
06/14/2022	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
07/25/2023	>100	>100	Pass	Yes	36.6	>100	Fail	Yes	
06/17/2025	>100	>100	Pass	Yes	>100	>100	Pass	Yes	

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.
- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

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

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

According to s. NR 106.08(6)(d), Wis. Adm. Code, TU<sub>a</sub> and TU<sub>c</sub> effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC<sub>50</sub>, IC<sub>25</sub> or IC<sub>50</sub> ≥ 100%).

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

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

Attachment #1

**Chronic WET Limit Parameters**

<b>TU<sub>c</sub> (maximum)</b> 100/IC <sub>25</sub>	<b>B</b> (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	<b>IWC</b>
100/27.27 = 3.67	2.6 Based on 4 detects	87%

$$[(TU_c \text{ effluent}) (B)(IWC)] = 8.29 > 1.0$$

Therefore, reasonable potential is shown for chronic WET limits using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from 03/23/2006 – 06/17/2025.

Expression of WET limits

Chronic WET limit =  $[100/IWC] TU_c = 1.1 TU_c$  expressed as a monthly average

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**

	<b>Acute</b>	<b>Chronic</b>
<b>AMZ/IWC</b>	Not Applicable.  <b>0 Points</b>	IWC = 87%.  <b>15 Points</b>
<b>Historical Data</b>	11 tests used to calculate RP. No tests failed.  <b>0 Points</b>	14 tests used to calculate RP. 3 tests failed.  <b>0 Points</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>	WWSF  <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. Cadmium, copper, mercury, nickel, zinc, chloride and ammonia detected. Additional Compounds of Concern: Beryllium, isophorone and silver  <b>5 Points</b>	Reasonable potential for limits for chloride based on CTC; Ammonia nitrogen limit carried over from the current permit. Cadmium, copper, mercury, nickel, zinc and ammonia detected. Additional Compounds of Concern: Beryllium, isophorone and silver  <b>10 Points</b>

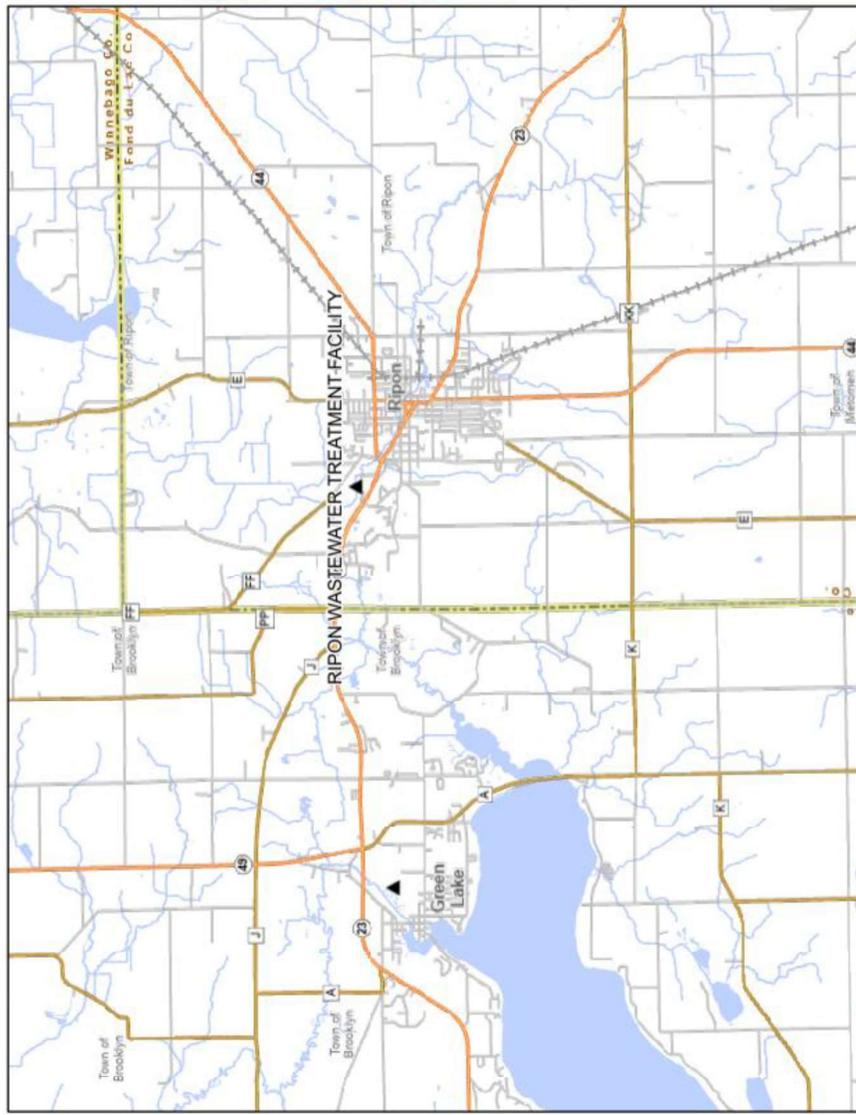
## Attachment #1

	<b>Acute</b>	<b>Chronic</b>
<b>Additives</b>	1 Water Quality Conditioner added. Permittee has proper P chemical SOPs in place: Yes <b>1 Point</b>	All additives used more than once per 4 days. <b>1 Point</b>
<b>Discharge Category</b>	5 Industrial Contributors. <b>9 Points</b>	Same as Acute. <b>9 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>20 Points</b>	<b>40 Points</b>
<b>Recommended Monitoring Frequency (from Checklist):</b>	1x yearly	1x yearly
<b>Limit Required?</b>	No	Yes Limit = 1.1 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, annual acute and chronic WET tests are recommended in the reissued permit.
- 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, an acute WET limit is required. The chronic WET limit shall be expressed as 1.1 TU<sub>c</sub> as a monthly average in the effluent limits table of the permit.
- 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.
- A minimum of annual acute and chronic monitoring is recommended because Ripon is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.
- Ripon is currently working on a TRE and completing monthly toxicity testing. A few more tests will be done to confirm toxicity has been removed from the effluent. After this toxicity testing is complete and demonstrates that toxicity has been removed, the annual WET testing and chronic limit may become effective.



# Ripon Outfall Location



**Legend:** (Some map layers may not be displayed)

- ▲ Surface Water Outfalls
- Rivers and Streams
- - - Intermittent Streams
- Open Water

**Latest Leaf Off Imagery**

- Red: Band\_1
- Green: Band\_2
- Blue: Band\_3

**2022 Leaf On Imagery**

- Red: Band\_1
- Green: Band\_2
- Blue: Band\_3

**2020 Leaf On Imagery**

- Red: Red
- Green: Green
- Blue: Blue

**Notes:**



Service Layer Credits:  
 2022 Leaf On Imagery, 2020 Leaf On Imagery, Latest Leaf Off Imagery, Basic Basemap (Carteod)  
 Map projection: NAD 1983 HARN Wisconsin TM  
 Date Printed: 11/21/2025 4:42 PM

**This map is a product generated by a DNR web mapping application.**  
 This map is for informational purposes only and is not intended for engineering or planning 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/topic/soils/soils.html>

**2019 Ammonia Limits Calculations**

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen 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 for Outfall 001. These limits are re-evaluated at this time due to the following changes:

- Updates to subchapter IV of ch. NR 106, Wis. Adm. Code allow limits based on available dilution instead of limits set to twice the acute criteria.

**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 = 0.411 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 1643 sample results were reported from 10/01/2014 to 03/31/2019. The maximum reported value was 8.1 s.u. (Standard pH Units). The effluent pH was 8.0 s.u. or less 99% of the time. The 1-day P<sub>99</sub>, calculated in accordance with s. NR 106.05(5), is 7.95 s.u. And the mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.0 s.u. Therefore, a value of 8.0 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.0 s.u. into the equation above yields an ATC = 8.41 mg/L and a computed daily maximum limit of 12.25 mg/L using the 1-Q<sub>10</sub> flow.

**Potential changes to daily maximum Ammonia Nitrogen effluent limitations:**

Updates to subchapter IV of ch. NR 106, Wis. Adm. Code (effective September 1, 2016) outline the option for the Department to implement use of the 1-Q<sub>10</sub> receiving water low flow to calculate daily maximum ammonia nitrogen limits if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits would 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.

	Ammonia Nitrogen Limit mg/L
2×ATC	16.82
1-Q <sub>10</sub>	12.25

The 1-Q<sub>10</sub> method yields the most stringent limits for Ripon Wastewater Treatment Facility.  
**Weekly Average & Monthly Average Limits based on Chronic Toxicity Criteria (CTC)**

Attachment #3

The ammonia limit calculation also warrants evaluation of weekly and monthly average limits based on chronic toxicity criteria for ammonia, since those limits relate to the assimilative capacity of the receiving water.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Warm Water Sport Fish Community is calculated by the following equation.

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

Where:

pH = the pH (s.u.) of the receiving water,

E = 0.854,

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

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

T = the temperature (°C) of the receiving water – (Early Life Stages Present), or

T = the maximum of the actual temperature (°C) and 7 - (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 the flow is used if the Temperature ≥ 16 °C, 25% of the flow is used if the Temperature < 11 °C, and 50% of the flow is used if the Temperature ≥ 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 Silver Creek, 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 for a WWSF classification.

Since minimal ambient data is available, the “default” basin assumed values are used for Temperature and background ammonia concentrations, while ambient pH data from Silver Creek is available. The background information is shown in the table below, with the resulting criteria and effluent limitations.

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
<b>Effluent Flow</b>	Qe (MGD)	1.8	1.8	1.8
<b>Background Information</b>	7-Q <sub>10</sub> (cfs)	1.60	1.6	1.6
	7-Q <sub>2</sub> (cfs)	3.60	3.6	3.6
	Ammonia (mg/L)	0.02	0.03	0.05
	Average Temperature (°C)	12	19	4
	Max Temperature (°C)	14	21	10
	pH (s.u.)	7.82	7.82	7.82
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	0.8	1.6	0.4

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
	Reference Monthly Flow (cfs)	1.53	3.06	0.765
<b>Criteria mg/L</b>	4-day Chronic			
	Early Life Stages Present	<b>7.76</b>	<b>5.26</b>	
	Early Life Stages Absent			<b>10.38</b>
	30-day Chronic			
	Early Life Stages Present	<b>3.10</b>	<b>2.10</b>	
	Early Life Stages Absent			<b>4.15</b>
<b>Effluent Limitations mg/L</b>	Weekly Average			
	Early Life Stages Present	<b>9.98</b>	<b>8.26</b>	
	Early Life Stages Absent			<b>11.87</b>
	Monthly Average			
	Early Life Stages Present	<b>4.80</b>	<b>4.38</b>	
	Early Life Stages Absent			<b>5.28</b>

### Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 10/01/2014 to 05/31/2019. This data is presented for informational purposes as Ripon Wastewater Treatment Facility currently has year-round daily, weekly, and monthly ammonia limits.

Ammonia Nitrogen mg/L	April - May	June - September	October - March
1-day P <sub>99</sub>	3.3	0.69	5.1
4-day P <sub>99</sub>	2.2	0.48	3.1
30-day P <sub>99</sub>	0.90	0.21	1.32
Mean*	0.29	0.06	0.51
Std	0.89	0.22	1.33
Sample size	305	487	910
Range	0.02-6.82	0.02-4.8	0.01-11.9

### Antidegradation:

The calculated weekly and monthly average limits calculated in this document are less restrictive than the current weekly and monthly ammonia limits in the current permit. Without a demonstration of need for a higher limit in accordance with s. NR 207.04 Wis. Adm. Code, the current weekly and monthly average limits are recommended to continue.

Where there are existing ammonia nitrogen limits in the permit, the limits are recommended to be retained regardless of reasonable potential, consistent with s. NR 106.33(1), 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).

Months Applicable	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
April & May	12	5.1	2.6
June – September	12	3.6	2.2
October – March	12	11	5.1

### Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

<b>Facility:</b>	Ripon WWTF	<b>7-Q<sub>10</sub>:</b>	1.60 cfs	<b>Temp Dates</b>	10/01/20	<b>Flow Dates</b>	09/01/20
<b>Outfall(s):</b>	001	<b>Dilution:</b>	25%	<b>Start:</b>	10/01/20	<b>End:</b>	10/31/25
<b>Date Prepared:</b>	11/21/2025	<b>f:</b>	0	<b>Stream type:</b>			
<b>Design Flow (Qe):</b>	1.80 MGD	Small warm water sport or forage fis					
<b>Storm Sewer Dist.</b>	0 ft	<b>Qs:Qe ratio:</b>	0.1 :1	<b>Calculation Needed?</b> YES			

Month	Water Quality Criteria		Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe) (MGD)		Representative Highest Monthly Effluent Temperature	Calculated Effluent Limit	
	Ta (default) (°F)	Sub-Lethal WQC (°F)		Acute WQC (°F)	7-day Rolling Average (Qesl) (MGD)		Daily Maximum Flow Rate (Qea) (MGD)	Weekly Average Effluent Limitation (°F)
JAN	33	49	3.20	1.261	1.475	52	56	91
FEB	34	50	3.20	1.302	1.582	52	56	90
MAR	38	52	4.00	1.899	2.688	53	57	86
APR	48	55	7.20	2.826	3.061	56	58	91
MAY	58	65	4.80	1.942	2.250	62	68	90
JUN	66	76	3.30	2.176	2.409	66	78	88
JUL	69	81	2.70	2.895	3.170	69	83	87
AUG	67	81	2.80	1.938	2.195	70	84	88
SEP	60	73	2.80	1.658	2.093	70	77	87
OCT	50	61	3.40	2.062	2.387	68	64	87
NOV	40	49	4.20	1.642	1.868	62	53	90
DEC	35	49	3.70	1.392	1.489	55	55	92

# **Chloride Source Reduction Measures Plan**

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**City of Ripon  
Fond du Lac County, WI  
April 2025**

Prepared by:

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# Chloride Source Reduction Measures Plan City of Ripon

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## CHAPTER 1 – INTRODUCTION

### 1.1 BACKGROUND

The City of Ripon (City) is located in Fond du Lac County, WI is approximately 20 miles northwest of Fond du Lac and 20 miles southwest of Oshkosh. As of the 2020 census, the City population was 7,863 people. The City is home to Ripon College and many commercial businesses, including several industries who produce high-strength wastewater of varying nature.

The City owns and maintains the sewage collection system and wastewater treatment facility, which is responsible for treating all wastewater generated by City users. The current facility is approved for annual average flow rate of 1.8 MGD (million gallons per day). The most recent major facility upgrade at the WWTF occurred in 2003.

The WWTF is allowed to discharge to Silver Creek on a daily basis under WPDES Permit No. WI-0021032-09-1. The City's current WPDES Permit expires on September 30, 2025 and is in the process of being renewed by the Wisconsin Department of Natural Resources (WDNR).

The current WPDES Permit was placed into effect on October 1, 2020. The current permit includes a variance to the water quality-based effluent limit (WQBEL) for chloride, in accordance with s. NR 106.83(2), Wis. Adm. Code. The effluent chloride limitation provided by the variance is 663 mg/L according to Section 3.2.1 of the WPDES permit. The City is required to demonstrate compliance with the variance limit by collecting and testing four effluent composite samples per month for chloride, collected on four consecutive days.

The target chloride concentration is 597 mg/L, expressed as a monthly average. Since the beginning of 2023, the City has usually been able to meet this value, however there are occasional monthly average exceedances, which are believed to be caused by high chloride quantities discharged by industrial users of the City's sewer system.

The City previously developed and implemented a source reduction measures (SRM) plan as part of the process to receive the chloride variance for the existing WPDES permit term. The City is applying for renewal of the existing chloride variance in the forthcoming WPDES because effluent chloride concentrations continue to vary, and in some cases exceed the target value of 597 mg/L.

### 1.2 PURPOSE AND SCOPE

The purpose of this report is to:

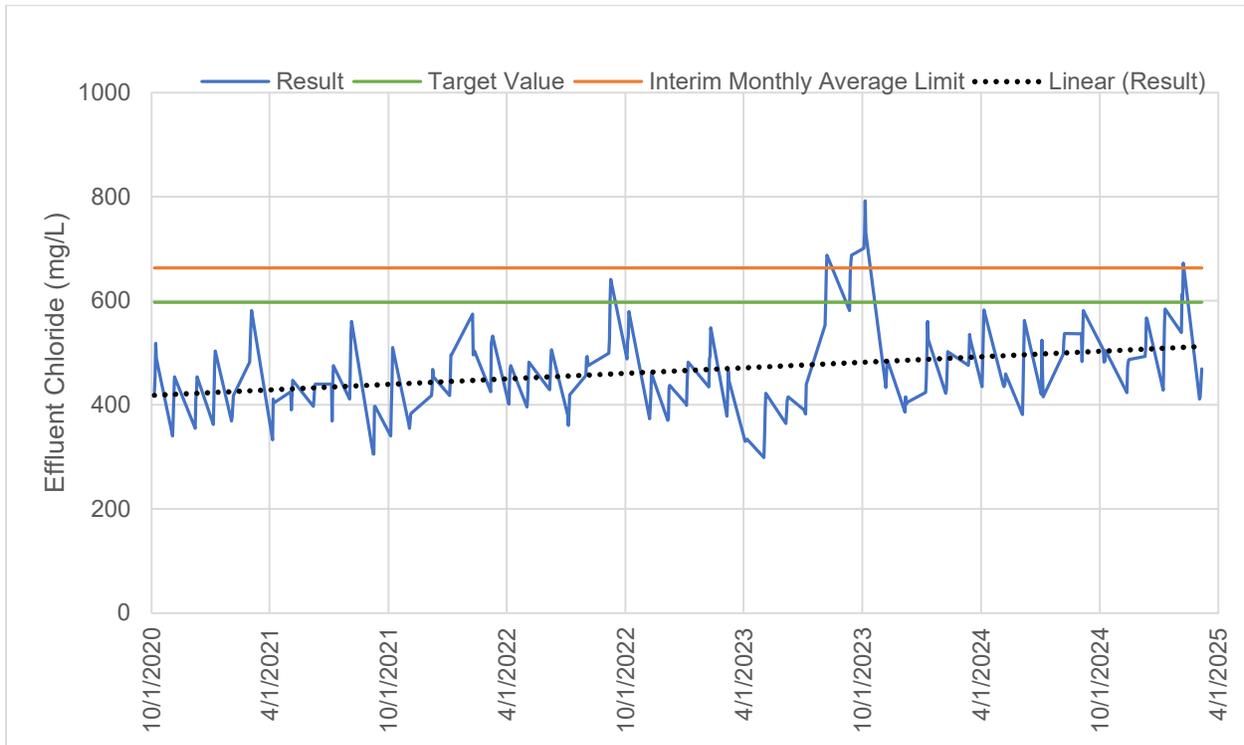
- Analyze trends in effluent chloride concentrations and mass discharge.
- Document historical chloride source reduction measures that have been previously implemented and comment on effectiveness.
- Identify future chloride source reduction measures which would be implemented during the forthcoming WPDES permit term.

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## CHAPTER 2 – HISTORICAL CHLORIDE DATA

### 2.1 EFFLUENT CHLORIDE DATA FROM WWTF

Effluent chloride concentrations are monitored by collecting four samples per month, as required by the WPDES permit. Currently, the permit requires the City to meet an interim monthly average limit of 663 mg/L. The target effluent chloride concentration is 597 mg/L. Figure 2-1 displays effluent chloride concentrations for individual samples collected dating back to October 2020, when the current WPDES permit became effective.



**Figure 2-1 Chloride Concentration Trend: Oct. 2020 – Mar. 2025**

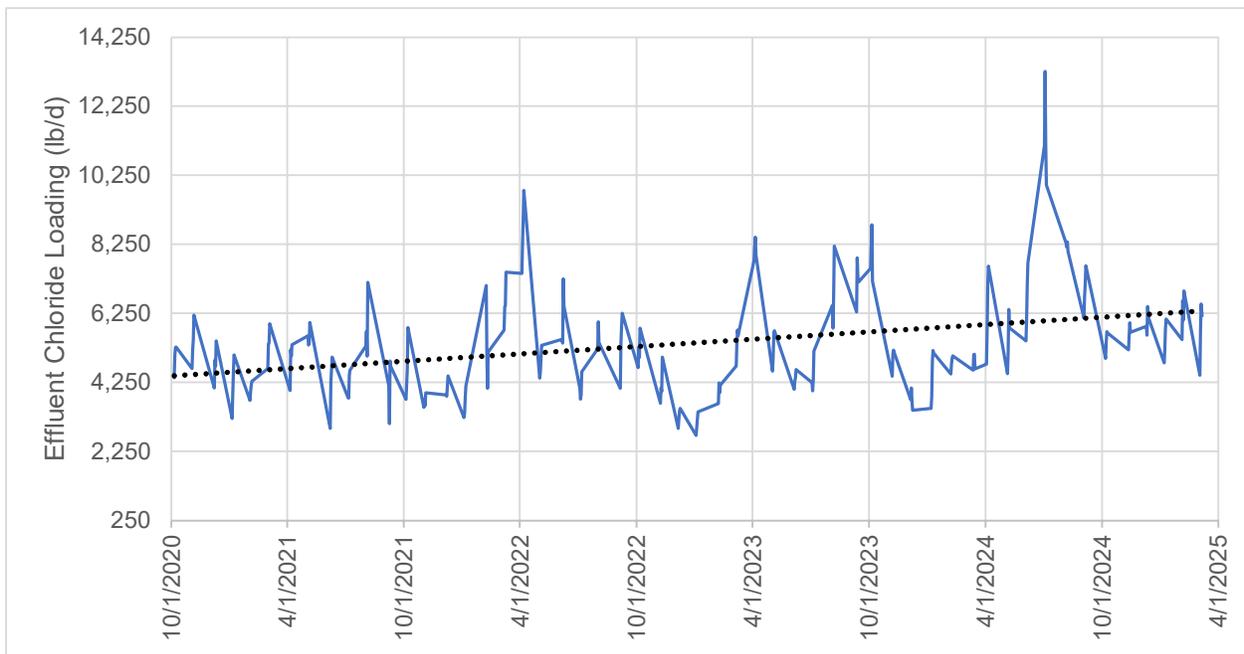
Table 2-1 provides a summary of chloride concentrations for each year since the WPDES permit went into effect. The average effluent chloride concentration from the WWTF generally exhibits an increasing trend throughout the WPDES permit term.

Generally, the City is able to meet the target value and interim monthly average limit, however there are instances where exceedances still occur. Across 217 individual effluent samples, there were 12 samples where concentration exceeded the target value of 597 mg/L. Ten individual samples had chloride measured above the interim monthly average of 663 mg/L. Further reduction of chlorides in the collection system are required to meet the target value for all conditions.

**Table 2-1: Chloride Concentration and Loading Summary**

Year	Average Effluent Chloride (mg/L)	Average Effluent Chloride Loading (lb/d)	Sample Count
2020 (Oct. – Dec.)	427	5,048	12
2021	425	4,561	48
2022	468	5,218	48
2023	476	5,425	48
2024	490	6,297	49
2025 (Jan. – Mar.)	518	5,818	12

The effluent chloride loading trend is displayed in Figure 2-2, for the duration of the current WPDES permit. The largest effluent chloride loading discharges occurred during July and August 2024, during periods where the WWTF was experiencing higher than normal flows. The chloride concentration target value and monthly average limit were not exceeded during this period.



**Figure 2-2 Chloride Loading Trend 2024-2025.**

## 2.2 HISTORICAL CHLORIDE DATA FROM INDUSTRIES

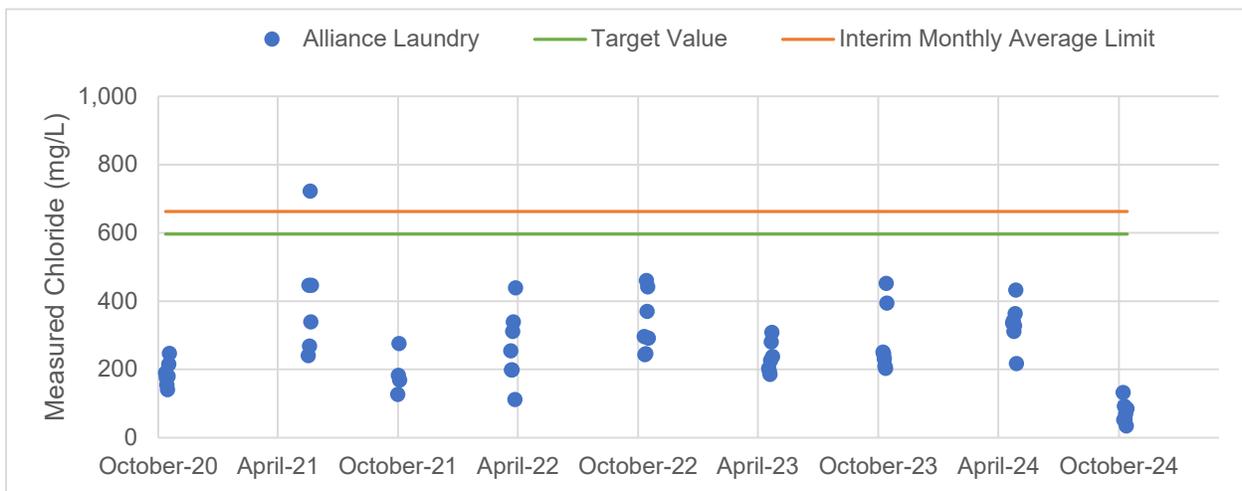
The four primary industries within the City service area who discharge high volumes of flow or high-strength wastewater are Alliance Laundry, Ripon Pickle, Signature Wafer, and MSI Express. The City has historically sampled each industry twice per year, for a period of 7 days each, in order to measure characteristics for billing purposes. The sample measurements obtained are representative of what each industry is discharging to the City sewer system.

Chloride data obtained from each industry throughout the current WPDES permit term is presented below.

### 2.2.1 ALLIANCE LAUNDRY

Alliance Laundry is a manufacturer of washer and dryer units and contributes around 100,000 gallons per day to the collection system on typical business days. Figure 2-3 displays all chloride measurements obtained from the user’s discharge prior to entering the collection system, from the period of October 2020 – October 2024. Of 59 samples collected, only one chloride measurement was above the target value.

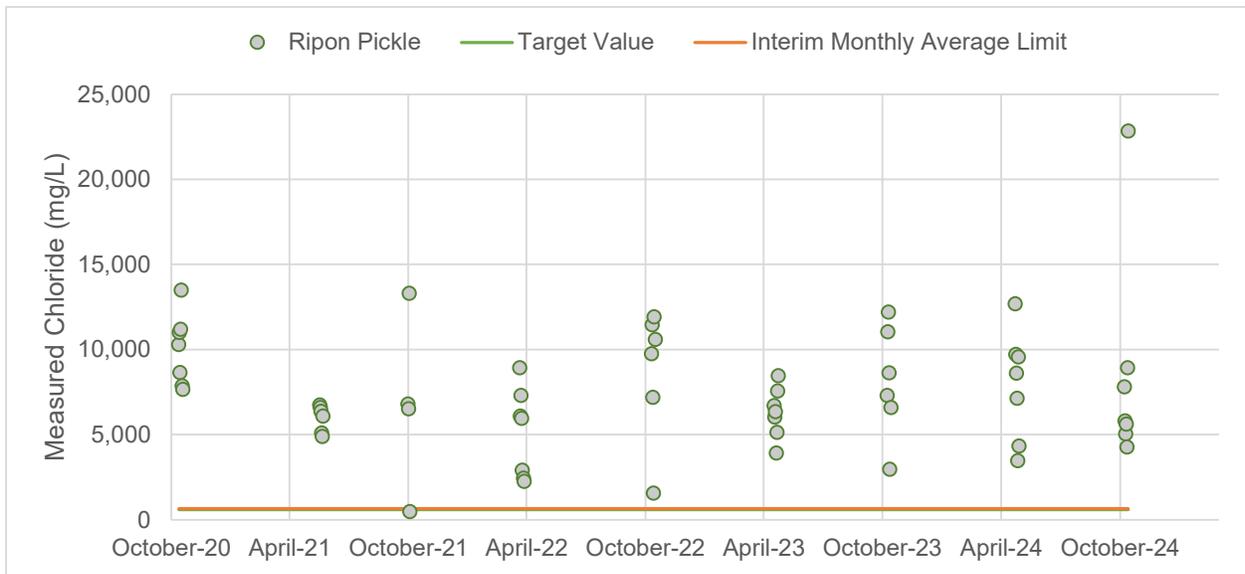
This data suggests that Alliance Laundry is likely not a major contributor of chlorides.



**Figure 2-3 Alliance Laundry Chloride Concentration Trend: Oct. 2020 – Oct. 2024**

### 2.2.2 RIPON PICKLE

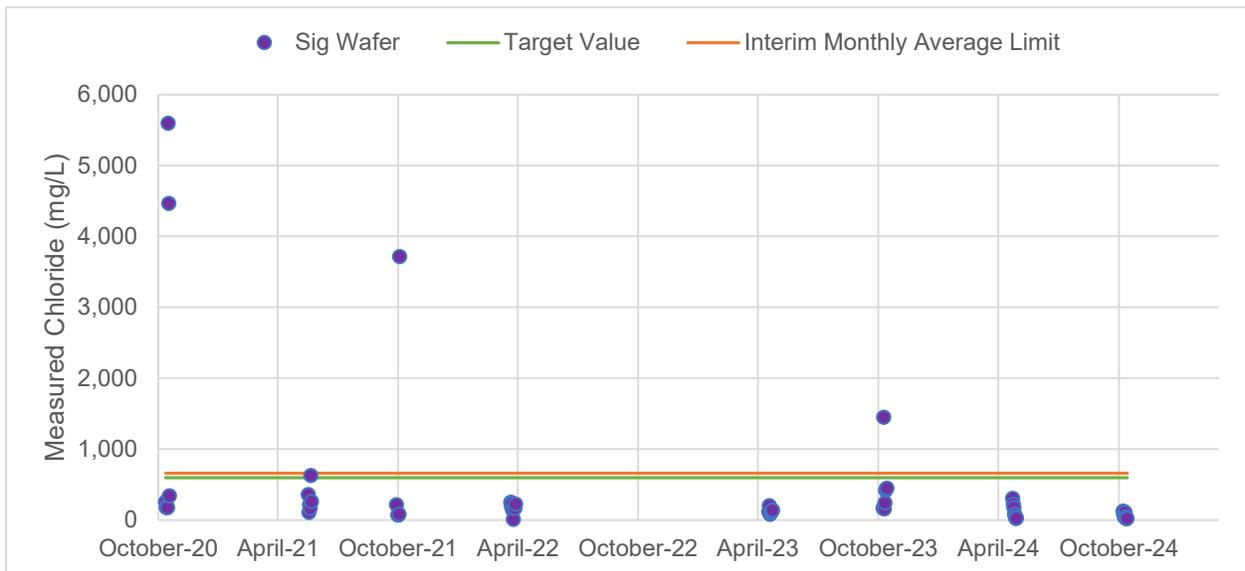
Ripon Pickle is a manufacturer of pickle products and has nearly 300 pickling vats on property. Figure 2-4 displays all chloride measurements obtained from the user’s discharge prior to entering the collection system, from the period of October 2020 – October 2024. Nearly all measurements are greater than the target value of 597 mg/L. The average chloride concentration discharged by this user during the evaluation period was nearly 7,500 mg/L.



**Figure 2-4 Ripon Pickle Chloride Concentration Trend: Oct. 2020 – Oct. 2024**

### 2.2.3 SIGNATURE WAFER

Signature Wafer produces wafer bar products. Figure 2-5 displays all chloride measurements obtained from the user’s discharge prior to entering the collection system, from the period of October 2020 – October 2024. No data was available for the month of October 2022. These measurements show some instances of high chloride discharge; only 4 of 53 measured samples contained chloride greater than the target value of 597 mg/L. Signature Wafer is a potential contributor of high chlorides to the collection system.

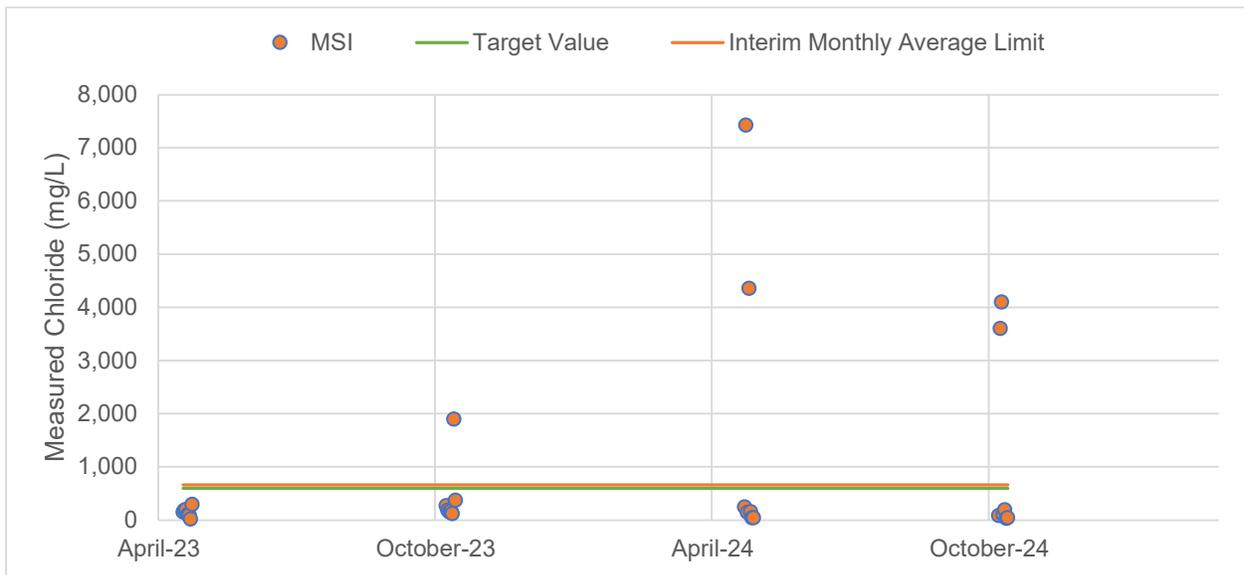


**Figure 2-5 Signature Wafer Chloride Concentration Trend: Oct. 2020 – Oct. 2024**

**2.2.4 MSI EXPRESS**

MSI Express is a packaging facility. Figure 2-6 displays all chloride measurements obtained from the user’s discharge prior to entering the collection system, from the period of April 2023 – October 2024. Prior to 2023, Smuckers had operated in the space occupied now by MSI; therefore the Smuckers data is no longer representative to what is currently being discharged.

These measurements show some instances of high chloride discharge; 5 of 28 measured samples contained chloride greater than the target value of 597 mg/L. MSI Express is a potential contributor of high chlorides to the collection system.



**Figure 2-6 MSI Express Chloride Concentration Trend: Apr. 2023 – Oct. 2024**

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## CHAPTER 3 –CHLORIDE REDUCTION MEASURES

### 3.1 PREVIOUS CHLORIDE REDUCTION PLAN AND MEASURES

The City originally provided a chloride source reduction measures plan to the WDNR in April 2020. This reduction plan is provided in Appendix A of this report. The 2024 Chloride Report, which was submitted by the City to the WDNR on January 16, 2025, summarized measures and actions taken during the WPDES permit term aimed at reducing the quantity of chlorides in the City's wastewater. The measures expected to have the greatest impact on chloride quantities are summarized below:

For Residential Sewer Users:

- Source reduction measures were directed towards water softener use by private homeowners. The City has distributed information in local newspaper and on the City's official website to raise awareness to residents about the potential impact of chlorides from water softeners. This information was intended to inform residents about the importance of maintaining private softeners and what types of water softeners should be used.
- An ordinance was adopted requiring the use of a demand-based water softener when private softener systems are replaced.

For Commercial and Industrial Sewer Users:

- The City has met frequently with significant industrial wastewater customers to educate their staff on the environmental impacts of chloride, as well as discussed best management practices for minimizing discharge of chlorides as a result of business operations.
- The City has implemented a Category B Sewer Use surcharge for chlorides, whereby users who discharge chloride in excess of 700 mg/L are assessed a per-pound surcharge.
  - The existing surcharge of \$0.053/pound is in the process of being reviewed and will potentially be updated during 2025.
    - Additional surcharges may be implemented to further discourage the discharge of high-strength chloride wastewater to the collection system by industrial customers.
- The City has met with Ripon Pickle, who is one of the largest contributors of chloride to the collection system, to discuss the City's concerns with chloride management.

Based on the data presented previously, the City's prior implemented reduction measures for chloride have generally been effective at allowing the City to meet the interim limit and target value for most conditions. However, the slight increasing trend in effluent concentration over the past 5 years suggests that further reduction measures are necessary to maintain effluent chloride below permitted levels.

It is expected that the most effective and realistic way to further reduce chlorides from current levels is to work with the City's industries who are known to contribute high quantities from their process operations. For the forthcoming WPDES permit term, chloride source reduction efforts will be focused on this area.

### 3.2 PROPOSED CHLORIDE REDUCTION MEASURE SCHEDULE FOR FUTURE

	2025	2026	2027	2028	2029
<b>1) Educate Sewer Users on Best Softener Practices</b>					
a) Educate users about Ripon's WPDES permit limits, the impact of chlorides on the environment, water softener O&M, reducing salt usage.	X	X	X	X	X
b) Update water softener survey records.	X	X	X	X	X
c) Encourage residents and commercial users to replace time-based softeners with demand-based softeners	X	X	X	X	X
<b>2) Improve Source Reduction from Industrial Customers</b>					
a) Meet with major industrial users to discuss the City's new WPDES permit and effluent limit requirements. Specifically discuss chloride.	X	X	X	X	X
b) Discuss best management practices with industrial customers to minimize the amount of chlorides discharged.	X	X	X	X	X
c) Develop revised surcharges for high-strength wastewater characteristics, including chloride.	X				
d) Implement revised high-strength wastewater surcharges.		X			
e) Develop protocol for increased monitoring and sampling of major industrial customers.	X				
f) Implement improved industrial sampling protocol.		X			
<b>3) Sample WWTF Effluent Chloride Concentrations</b>					
a) Sample WWTF effluent chloride per WDPES permit requirements (4 samples per month) to monitor SRM effectiveness.	X	X	X	X	X
<b>4) Winter Road Maintenance Plan for Reduced Salt Discharge</b>					
a) Develop a winter road maintenance plan.	X	X			
b) Implement the winter road maintenance plan.			X	X	X

**Appendix A**  
**April 2020 Chloride Source Reduction Measures Plan – City of Ripon**

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# CITY OF RIPON

100 Jackson Street • Ripon, Wisconsin 54971-1396

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April 24, 2020

Mr. Phillip Spranger  
Municipal Wastewater Permit Drafter  
Wisconsin Department of Natural Resources  
3911 Fish Hatchery Road  
Fitchburg, WI 53711-5397

Re: Chloride Source Reduction Measures Plan - Revised

## **Introduction**

This document serves as the chloride source reduction measures plan which is a required addition of the City of Ripon's reapplication for a Wisconsin Pollution Discharge Elimination System (WPDES) permit.

The City is currently operating under WPDES permit number WI-0021032-08-0 with an effective date of October 1, 2014. The permit included a chloride variance with a chloride limit of 780 milligrams per liter (mg/L) and a 2019 target value of 700 mg/L.

## **Previously Implemented Source Reduction Activities**

On April 1, 2010, the City had implemented an ordinance that all new or replacement water softeners installed in residential, commercial, industrial and institutional buildings within the city limits and in all sanitary districts and utility districts served by the city wastewater facility shall be "demand based" water softeners. Softeners functioning on predetermined time intervals are no longer permitted in the city, sanitary and utility districts. The Utility had notified their customers of the new ordinance and offered hardness testing to assist softener owners in "tuning-up" their softener units.

As plans for new buildings come in for review, water softening equipment is inquired about and a copy of the ordinance is given to the submitter of the plans.

Our local plumbers and water softener businesses have supported our efforts to help educate homeowners, commercial and industrial business owners of the options available to them for increasing softener efficiency while reducing chloride impacts to the environment.

The Ripon Wastewater Utility staff continues to meet yearly with the major industrial customers to discuss their plans of reducing their levels of chloride discharges. These meetings are important as we find a few new employees each year and we like to update the new employees about the significance of reducing chlorides for their company and the environment. During those meetings, we request that they reduce their chloride discharges through optimizing water softener operation and by training their personnel to be more aware of salt conservation. We also share some of the data that we've collected to show them the past and current trends.

We suggest to those contributors that they develop and implement procedures to help reduce chlorides from entering the waste stream and to look for alternatives to chloride-based materials they may be using. We visit all of our significant facilities every month when we read water and deduct meters which allows us to observe and discuss their production and clean-up practices.

In regards to Ripon Pickle's chloride contribution, they have 293 pickling vats on their property. There is a flume meter connected to the storm sewer system on their property which conveys any storm water laden with chlorides to the wastewater treatment facility. They also have food production/preparation whereupon they rinse the brined vegetables. That water goes to a tank under their facility and then to the wastewater facility. We have discussed their clean-up practices and keeping their floor drain sieves in place throughout the day.

Prior to the implementation of new chloride parameter surcharges into our ordinance in 2017, the wastewater utility and their consultant SEH, entered into discussions with WDNR Engineer, Mark Stanek. It was recommended that the industrial dischargers subject to the new surcharge not be levied surcharges until the 700 mg/L target becomes effective on October 1, 2018. The Utility then provided calculations of the chloride surcharges on billing statements for their reference only. Doing so provided time for the industrial customers to implement chloride reduction measures prior to the new surcharges taking effect.

Although there hasn't been a long period of time since the chloride surcharge, we haven't seen a substantial reduction in chlorides that we were hoping for. The Wastewater staff will need to conduct a more thorough investigation of all of the industrial and commercial customers to ascertain which businesses have softeners and if any chloride products are used in their business operations.

In addition, the wastewater staff will partner with the water utility staff to gather information on residential softeners. As the water utility regularly enters homes to service the water meters, they will gather customer softener information for the wastewater staff.

Our local newspaper will be asked to run a story about chlorides at the wastewater facility. In doing so, it will assist us in getting out more chloride information to our customers and in turn, we hope to receive more updated information on their softeners.

The Wastewater Utility will investigate ways to utilize the funds generated by the surcharge to help reduce chlorides by possibly providing rebates to customers who upgrade their older softeners to demand based units and partnering with local plumbers or water conditioning companies to conduct workshops on proper softener operation. From October, 2018 to date, the surcharge has generated \$32,391.52 which can be used to fund the rebate program and other SRM activities such as offering rebates to small commercial businesses for upgrading softeners.

If there are any questions regarding this report, please contact Chris Liveris, City of Ripon Utility Manager, 920-748-4912.

cc: File

## Chloride Source Reduction Plan

### City of Ripon

**WPDES Permit Number: WI-0021032-08-1**

**Chloride Target Limit: 700 mg/l**

### Source Reduction Plan

Source Reduction Measure	Actions	Start Completion / Frequency
<b>SRMs Targeting Water Softeners</b>		
Educate softener owners of the impact of chloride on water quality, provide information about increasing softener efficiency	Provide information through brochures and on the City's website. Investigate conducting softener workshops to assist homeowners. Offer a water hardness test to homeowners	Start: Ongoing Frequency: Annually / Ongoing
Encourage homeowners and small businesses to replace their old, time-based softeners with demand-based softeners	Investigate feasibility of using surcharge funds to offer rebates to homeowners and small businesses who replace their softeners	Start: Year One Frequency: Ongoing
Adopt and implement an ordinance that requires the use of demand-based softener regeneration for new and softener replacement	Ordinance adopted April 1, 2010 Newspaper articles/notices reminding customers of the ordinance requirements	Start: Ongoing Frequency: Annually
<b>SRMs Targeting Commercial and Industrial Sources</b>		
Meet with industrial and commercial chloride contributors to educate their management staff of the chloride impact on water quality and the environment	Provide individual chloride information to industrial customers and their yearly chloride discharge trends	Start: Ongoing Frequency: Annually

<b>SRMs Targeting Commercial and Industrial Sources (Continued)</b>		
<b>Source Reduction Measure</b>	<b>Action</b>	<b>Start: Completion / Frequency</b>
Discuss with industries the importance of best management practices to reduce or eliminate discharge to the sanitary sewer	Conduct yearly meetings with industries to discuss current and long term plans at their facilities	Start: Ongoing Frequency: Annually
Identify more commercial sources of chlorides	Survey commercial businesses to better understand their operations and if softeners are installed	Start: Year One Frequency: Ongoing
Discuss with significant chloride contributors alternatives to replace chloride-based materials due to tighter DNR parameters and upcoming surcharges	Implement chloride surcharge into current ordinance for charging significant contributors over 700 mg/l when bi-annual sampling is conducted	Start: Ongoing, Ordinance amended September 30, 2018 Frequency: Charges modified 2X per year based on results from bi-annual testing
Discussions with significant contributor Ripon Pickle to reduce their chloride contribution	Discuss possible alternative to chlorides for pickling and if reusing/recycling their brine solution is feasible	Start: Ongoing Frequency: Annually
Discussions with Department of Public Works to implement BMPs to reduce/eliminate the discharge of chloride to the sanitary sewer system at City facilities used to store vehicles used for snow plowing and road de-icing	Assist in developing management practices to reduce/eliminate the discharge of chloride into the sanitary sewer system at City facilities storing vehicles for snow plowing and road de-icing	Start: Year One Frequency: Annual / Ongoing

# Facility Specific Chloride Variance Data Sheet

**Directions:** Please complete this form electronically. Record information in the space provided. Select checkboxes by double clicking on them. Do not delete or alter any fields. For citations, include page number and section if applicable. Please ensure that all data requested are included and as complete as possible. Attach additional sheets if needed.

## Section I: General Information

**A. Name of Permittee:** City of Ripon  
**B. Facility Name:** Ripon Wastewater Treatment Facility  
**C. Submitted by:** Wisconsin Department of Natural Resources  
**D. State:** Wisconsin **Substance:** Chloride **Date completed:** February 26, 2026  
**E. Permit #:** WI-0021032-10-0 **WQSTS #:** (EPA USE ONLY)  
**F. Duration of Variance** **Start Date:** July 1, 2026 **End Date:** June 30, 2031  
**G. Date of Variance Application:** February 17, 2025  
**H. Is this permit a:**  First time submittal for variance  
 **Renewal of a previous submittal for variance** (Complete Section IX)

**I. Description of proposed variance:** The City of Ripon has requested a variance from the chloride water quality-based effluent limit (WQBEL) of 447 mg/L as a weekly average. An interim limit of 580 mg/L as a weekly average is proposed along with requirements that Ripon maintain chloride effluent concentrations below the interim limit, implement a Chloride Source Reduction Measures (SRM) plan, submit annual chloride SRM progress reports and strive to meet a chloride target value of 522 mg/L (weekly avg) by the end of the permit term.

## J. List of all who assisted in the compilation of data for this form

Name	Email	Phone	Contribution
Sarah Donoughe	Sarah.Donoughe@Wisconsin.gov	920-366-6076	Permit Drafter/Variance Coordinator
Mark Stanek	Mark.Stanek@Wisconsin.gov	920-808-0670	Compliance Engineer
Nicole Krueger	Nicole.Krueger@Wisconsin.gov	414-897-5750	Limits Calculator

## Section II: Criteria and Variance Information

**A. Water Quality Standard from which variance is sought:** Chloride WQBEL (447 mg/L)  
**B. List other criteria likely to be affected by variance:** None.  
**C. Source of Substance:** Industrial contributors, residential and commercial water softeners, and I/I of road salt in winter months into the collection system.  
**D. Ambient Substance Concentration:** 33.8 mg/L  Measured  Estimated  
 Default  Unknown  
**E. If measured or estimated, what was the basis? Include citation.** The background chloride data is from Silver Creek from October 2011.  
**F. Average effluent discharge rate:** 1.8 MGD **Maximum effluent discharge rate:** 3.2 MGD  
**G. Effluent Substance Concentration:** 1-day P99 = 699 mg/L  Measured  Estimated  
4-day P99 = 576 mg/L  Default  Unknown  
30-day P99 = 507 mg/L  
Mean = 470 mg/L  
**H. If measured or estimated, what was the basis? Include Citation.**  
Permit-required effluent monitoring from September 2020 – October 2025 (245 samples).  
**I. Type of HAC:**  Type 1: HAC reflects waterbody/receiving water conditions  
 Type 2: HAC reflects achievable effluent conditions  
 Type 3: HAC reflects current effluent conditions

<p><b>J. Statement of HAC:</b> The Department has determined the highest attainable condition of the receiving water is achieved through the application of the variance limit in the permit, combined with a permit requirement that the permittee implement its Chloride SRM plan. Thus, the HAC at commencement of this variance is 580 mg/L, which reflects the greatest chloride reduction achievable with the current treatment processes, in conjunction with the implementation of the permittee's Chloride SRM plan. The current effluent condition is reflective of on-site optimization measures that have already occurred. This HAC determination is based on the economic feasibility of available compliance options for the Ripon Wastewater Treatment Facility at this time (see Economic Section below). The permittee may seek to renew this variance in the subsequent reissuance of this permit; the Department will reevaluate the HAC in its review of such a request. A subsequent HAC cannot be defined as less stringent than this HAC.</p>
<p><b>K. Variance Limit:</b> 580 mg/L as a weekly average</p>
<p><b>L. Level currently achievable (LCA):</b> 580 mg/L as a weekly average</p>
<p><b>M. What data were used to calculate the LCA, and how was the LCA derived? (Immediate compliance with LCA is required.)</b> The LCA equals the 4-day P99.</p>
<p><b>N. Explain the basis used to determine the variance limit (which must be <math>\leq</math> LCA). Include citation.</b>  The variance limit is set equal to the 4-day P99. The limit is established in accordance with s. 283.15 (5), Wis. Stats., and ch. NR 106 Subchapter II, Wis. Adm. Code.  Chapter NR 106, Subchapter VII, Wis. Adm. Code, allows for a variance, the imposition of a less restrictive interim limit, a compliance schedule that stresses source reduction and public education, and allowance for a target value or limit to be a goal for reduction.</p>
<p><b>O. Select all factors applicable as the basis for the variance provided</b>    <input type="checkbox"/> 1   <input type="checkbox"/> 2   <input type="checkbox"/> 3   <input type="checkbox"/> 4   <input type="checkbox"/> 5   <input checked="" type="checkbox"/> 6 <b>under 40 CFR 131.10(g). Summarize justification below:</b>  The use of a reverse osmosis system was evaluated. The cost of the system was estimated to an average cost per household that would result in a MHI of 7.19%. Installing centralized lime softening on the current municipal water supply was also evaluated. The cost of the system was estimated to an average cost per household that would result in a MHI of 14.61%. Without a variance, meeting the water quality standard of 447 mg/L would result in substantial and widespread economic and social impacts.</p>
<p><b>Section III: Location Information</b></p>
<p><b>A. Counties in which water quality is potentially impacted:</b>    <u>Fond du Lac; Green Lake</u></p>
<p><b>B. Receiving waterbody at discharge point:</b>    <u>Silver Creek</u></p>
<p><b>C. Flows into which stream/river?</b>    <u>Green Lake</u>                      <b>How many miles downstream?</b>    <u>~4.5 mi.</u></p>
<p><b>D. Coordinates of discharge point (UTM or Lat/Long):</b>    <u>Lat: 43.85493° N / Long: 88.85682° W</u></p>
<p><b>E. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the chronic criterion of the substance for aquatic life protection?</b> The chronic criteria should be met within several stream lengths downstream of Ripon's outfall.</p>
<p><b>F. Provide the equation used to calculate that distance (Include definitions of all variables, identify the values used for the clarification, and include citation):</b> <math>Q_e = 1.8 \text{ MGD} = 2.785 \text{ cfs}</math>. 4-day <math>P_{99} = 576 \text{ mg/L}</math>. Streamflow needed to meet <math>395 \text{ mg/L} = [Q_e \times 576 \text{ mg/L} + Q_s \times 33.8 \text{ mg/L}] / [Q_e + Q_s]</math>  Solving this equation for <math>Q_s</math>, <math>Q_s = 1.4 \text{ cfs}</math>  Annual <math>7Q_{10}</math> at the point of discharge is 1.6 cfs. After complete mixing, the instream concentration will meet 395 mg/L. It is expected this will happen within several stream lengths downstream of Ripon's outfall. Other downstream tributaries will provide additional mixing prior to Green Lake.</p>

**G. What are the designated uses associated with the direct receiving waterbody, and the designated uses for any downstream waterbodies until the water quality standard is met?**  
 Warm Water Sport Fish (WWSF) community, non-public water supply, and recreational use.

**H. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody:** None.

Permit Number	Facility Name	Facility Location	Variance Limit [mg/L]
N/A			

**I. Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet**  
 See attached map (Current Variances - Ripon WWTF Outfall 001).

**J. Is the receiving waterbody on the CWA 303(d) list? If yes, please list the impairments below.**     Yes     No     Unknown

River Mile	Pollutant	Impairment
0.97 – 12.41	Total Phosphorus	Unknown
0.97 – 14.36	Sediment/Total Suspended Solids	Elevated Water Temperature, Degraded Habitat

**K. Please list any contributors to the POTW in the following categories:**

Food processors (cheese, vegetables, meat, pickles, soy sauce, etc.)	Ripon Pickle; Signature Wafer
Metal Plating/Metal Finishing	AFK Foundry
Car Washes	Shell Car Wash; BP Car Wash
Municipal Maintenance Sheds (salt storage, truck washing, etc.)	City Public Works facilities
Laundromats	Wash Tub Coin Laundry; Natures Care Chemdry; Splish Splash Clothes Bath
Other presumed commercial or industrial chloride contributors to the POTW	MSI Express; Alliance Laundry

**L. If the POTW does not have a DNR-approved pretreatment program, is a sewer use ordinance enacted to address the chloride contributions from the industrial and commercial users? If so, please describe.**

The City of Ripon’s sewer user ordinance was amended on September 22, 2025. Category B industries will be billed at the new rate beginning with their January 2026 bill. The surcharge for customers who discharge nondomestic strength wastewater (as defined in the ordinance) with concentrations of chloride greater than 700 mg/L will increase from \$0.053/lb to \$0.06/lb and the volume charge is increasing from \$2.66 per hundred cubic feet of wastewater to \$4.35.

Another change involves sampling frequency, which will shift from seven consecutive days every six months to two consecutive days each month. This adjustment is intended to better track discharge concentrations and flows, as the previous biannual schedule may have missed seasonal variability.

**Section IV: Pretreatment** (complete this section only for POTWs with DNR-Approved Pretreatment Programs. See w:\Variances\Templates and Guidance\Pretreatment Programs.docx)

**A. Are there any industrial users contributing chloride to the POTW? If so, please list.**  
 N/A

**B. Are all industrial users in compliance with local pretreatment limits for chloride? If not, please include a list of industrial users that are not complying with local limits and include any relevant correspondence between the POTW and the industry (NOVs, industrial SRM updates and timeframe, etc)**  
 N/A

**C. When were local pretreatment limits for chloride last calculated?**  
 N/A

**D. Please provide information on specific SRM activities that will be implemented during the permit term to reduce the industry’s discharge of the variance pollutant to the POTW**  
 N/A

**Section V: Public Notice**

**A. Has a public notice been given for this proposed variance?**  Yes  No  
**B. If yes, was a public hearing held as well?**  Yes  No  N/A  
**C. What type of notice was given?**  
 Notice of variance included in notice for permit  Separate notice of variance  
**D. Date of public notice:** March 12, 2026 **Date of hearing:** April 27, 2026  
**E. Were comments received from the public in regards to this notice or hearing? (If yes, see notice of final determination)**  Yes  No

**Section VI: Human Health**

**A. Is the receiving water designated as a Public Water Supply?**  Yes  No  
**B. Applicable criteria affected by variance:** No human health criteria for chloride.  
**C. Identify any expected impacts that the variance may have upon human health, and include any citations:**  
 None.

**Section VII: Aquatic Life and Environmental Impact**

**A. Aquatic life use designation of receiving water:** Warm Water Sport Fish (WWSF) community  
**B. Applicable criteria affected by variance:** Chronic toxicity criterion for chloride is 395 mg/L from ch. NR 105, Wis. Adm. Code, and is applicable in all Wisconsin waters regardless of use designation.  
**C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:**  
 At 4-day P<sub>99</sub>, design flow of 1.8 MGD, and 1/4<sup>th</sup> of the 7Q10 of 1.6 cfs the chloride concentration in the mixing zone is estimated at 508 mg/L. This concentration exceeds the SMCV for fathead minnow (433 mg/L), daphnia pulex (372 mg/L) and ceriodaphnia dubia (429 mg/L).  
**D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations:** There are no Endangered or Threatened species known that would affect the water quality criterion, as the chronic toxicity criterion for chloride is more stringent than all genus mean chronic values for organisms with chloride toxicity data. As a result, no endangered species with data would need more protection than already provided by the existing criterion.  
**Citation:** U.S. Fish & Wildlife Service – Environmental Conservation Online System (<http://www.fws.gov/endangered/>) and National Heritage Index (<http://dnr.wi.gov/topic/nhi/>)

**Section VIII: Economic Impact and Feasibility**

**A. Describe the permittee’s current pollutant control technology in the treatment process:**  
 This facility is an oxidation ditch facility that incorporates biological phosphorus removal. Raw wastewater is pumped up to a fine screening area and then to three anoxic zone mixing basins where it is blended with return activated sludge (RAS) from the final clarifiers. Wastewater then enters two oxidation ditches that are operated in parallel. Final clarifiers are next and those are followed by tertiary sand filters. The final effluent goes through UV disinfection prior to discharge. Waste activated sludge (WAS) is pumped to two aerated storage tank basins that were left over from the old treatment system. WAS is then sent to a gravity belt thickener. Thickened sludge is stored in a small concrete storage tank. Ripon has contracted out its sludge storage and land

<p>application needs. Urea may be added to the raw wastewater after screening, as needed to provide the proper nutrient ratios.</p>
<p><b>B. What modifications would be necessary to comply with the current limits? Include any citations.</b> As noted above, the cost of providing reverse osmosis at the wastewater treatment facility or centralized lime softening for the drinking water system were evaluated and determined to be prohibitively expensive.</p>
<p><b>C. How long would it take to implement these changes?</b> Unknown; neither modification is economically feasible.</p>
<p><b>D. Estimate the capital cost (Citation):</b> RO: \$2,025,000; Lime Softening: \$12,437,130 (<i>WDNR Form 3400-193 Chloride Variance Application from permittee</i>)</p>
<p><b>E. Estimate additional O &amp; M cost (Citation):</b> RO: \$657,000 (<i>WDNR Form 3400-193 Chloride Variance Application from permittee</i>)</p>
<p><b>F. Estimate the impact of treatment on the effluent substance concentration, and include any citations:</b> Reverse osmosis (RO) systems can be operated to achieve levels of chloride below the water quality standard of 447 mg/L. However, it is not economically feasible for the City of Ripon WWTF at this time.</p>
<p><b>G. Identify any expected environmental impacts that would result from further treatment, and include any citations:</b> End-of-pipe RO wastewater treatment technology for chloride produces concentrated brine that can be as much or more of an environmental liability than the untreated effluent. Since the concentrated brine cannot be further treated, the only recourse for the disposal of the brine is transfer to another community, which is often not feasible. Appropriate chloride source reduction activities are preferable environmentally to effluent end-of-pipe treatment in most cases, since the end product of treatment (production of a concentrated brine) does not remove the load of chloride from the environment.</p> <p>There would be some impacts based on disposal of brine from RO. These include air pollution impacts from trucking brine and increased chloride impacts at the point where brine is discharged.</p>
<p><b>H. Is it technically and economically feasible for this permittee to modify the treatment process to reduce the level of the substance in the discharge?</b>      <input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No    <input type="checkbox"/> Unknown</p> <p>RO treatment of the City of Ripon WWTF effluent to meet the WQBEL is technically feasible. However, it is not economically feasible. See DNR variance application and screening tool for costs of reverse osmosis. Use of reverse osmosis at the WWTF was evaluated; the resulting total cost for sewer user rates was estimated to result in an average cost to households that would be 7.19% of the MHI. An increase of this magnitude would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located.</p> <p>Lime softening treatment of the City of Ripon water supply is technically feasible and would potentially enable the WWTF effluent to meet the chloride WQBEL. However, lime softening is not economically feasible. See the Chloride Variance Economic Eligibility Tool (Lime Softening) screening tool for costs of lime softening. Use of municipal lime softening was evaluated; the resulting cost for sewer user rates was estimated to result in an average cost to households that would be 14.61% of the MHI. An increase of this magnitude would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located.</p>
<p><b>I. If treatment is possible, is it possible to comply with the limits on the substance?</b>      <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No    <input type="checkbox"/> Unknown</p>
<p><b>J. If yes, what prevents this from being done? Include any citations.</b> The cost of adding RO to the existing treatment plant's treatment train would cause substantial and widespread adverse social and economic impacts in the area where the discharge is located. Implementation of the SRMs in the proposed permit is preferable economically and environmentally to installing RO.</p>
<p><b>K. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:</b></p> <ol style="list-style-type: none"> <li>1. Reverse Osmosis (RO) – not economically feasible (7.19% MHI)</li> <li>2. Regional Lime Softening Treatment – not economically feasible (14.61% MHI)</li> </ol>

**Section IX: Compliance with Water Quality Standards**

**A. Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations.**

The current permit contains a variance to the water quality-based effluent limit (WQBEL) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code. During the permit term, the permittee implemented the following SRMs:

- Maintained chloride effluent levels at or below the interim limit of 663 mg/L as a weekly average;
- Educated softener owners of the impact of chloride on water quality, provided information through brochures and on the City’s website about increasing softener efficiency, investigated conducting water softener workshops to assist homeowners, and offered water hardness tests to homeowners;
- Encouraged homeowners and small businesses to replace old, time-based softeners with demand-based softeners;
- Continued to implement the ordinance that requires the use of demand-based softener regeneration for new and softener replacements;
- Investigated the feasibility of using chloride surcharge funds to offer rebates to homeowners and small businesses who replace their softeners;
- Met with industrial and commercial chloride contributors to educate their management staff of the chloride impact on water quality and the environment;
- Discussed with industries the importance of best management practices to reduce or eliminate chloride discharge to the sanitary sewer;
- Discussed with significant chloride contributors such as Ripon Pickle alternatives to chlorides for pickling and if reusing/recycling their brine solution is feasible;
- Implemented chloride surcharge in current ordinance which charges significant contributors of over 700 mg/L of chloride when bi-annual sampling is conducted, and evaluated the feasibility of using chloride surcharge funds to offer rebates to homeowners and small businesses who replace their softeners;
- Held discussions with Department of Public Works regarding implementing management practices to reduce/eliminate the discharge of chloride to the sanitary sewer system at City facilities used to store vehicles used for snow plowing and road de-icing;
- Submitted annual progress reports on the implementation of chloride source reduction measures; and
- Strived to meet a chloride target value of 597 mg/L by the end of the permit term.

**B. Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations.**

This proposed permit contains a variance to the water quality-based effluent limit (WQBEL) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code. As conditions of this variance the permittee shall (a) maintain effluent quality at or below the interim effluent limitation specified in the proposed permit, (b) implement the chloride source reduction measures specified in the City of Ripon Chloride Source Reduction Measures Plan dated April 2025, and (c) perform the actions listed in the Chloride SRM (Target Value) Schedule (see the Schedules section of the proposed permit).

**Section X: Compliance with Previous Permit (Variance Reissuances Only)**

**A. Date of previous submittal:** July 17, 2020 **Date of EPA Approval:** August 10, 2020

**B. Previous Permit #:** WI-0021032-09-0 **Previous WQSTS #:** \_\_\_\_\_ (EPA USE ONLY)

**C. Effluent substance concentration:** 580 mg/L (4-day P99) **Variance Limit:** 663 mg/L (weekly average)

**D. Target Value(s):** 597 mg/L **Achieved?**  Yes  No  Partial

**E. For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.**

Condition of Previous Variance	Compliance
Maintain chloride effluent levels at or below the interim limit of 663 mg/L as a weekly average.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <b>Note:</b> Out of 217 samples, 10 sample results exceeded the weekly average limit of 663 mg/L.

Educate softener owners of the impact of chloride on water quality, provide information through brochures and on the City's website about increasing softener efficiency, investigate conducting water softener workshops to assist homeowners, and offer water hardness tests to homeowners.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Encourage homeowners and small businesses to replace old, time-based softeners with demand-based softeners.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Continue to implement the ordinance that requires the use of demand-based softener regeneration for new and softener replacements.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Investigate the feasibility of using chloride surcharge funds to offer rebates to homeowners and small businesses who replace their softeners.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Meet with industrial and commercial chloride contributors to educate their management staff of the chloride impact on water quality and the environment.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Discuss with industries the importance of best management practices to reduce or eliminate chloride discharge to the sanitary sewer.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Discuss with significant chloride contributors such as Ripon Pickle alternatives to chlorides for pickling and if reusing/recycling their brine solution is feasible.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Implement chloride surcharge in current ordinance which charges significant contributors of over 700 mg/L of chloride when bi-annual sampling is conducted and evaluate the feasibility of using chloride surcharge funds to offer rebates to homeowners and small businesses who replace their softeners.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Discussions with Department of Public Works regarding implementing management practices to reduce/eliminate the discharge of chloride to the sanitary sewer system at City facilities used to store vehicles used for snow plowing and road de-icing.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Submit annual progress reports on the implementation of chloride source reduction measures.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Strive to meet a chloride target value of 597 mg/L by the end of the permit term.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No