

Permit Fact Sheet

General Information

Permit Number	WI-0035513-07-0
Permittee Name and Address	Poygan Poy Sippi Sanitary District No. 1 7901 County Road B, Winneconne, WI 54986
Permitted Facility Name and Address	Poygan Poy Sippi Sanitary District No. 1 WWTF 7901 County Road B, Winneconne, WI
Permit Term	October 01, 2026 to September 30, 2031
Discharge Location	South shore of Lake Poygan (by Spruce Lane; 188 yards out)
Receiving Water	Lake Poygan, in the Pine and Willow Rivers Watershed in the Wolf River Drainage Basin, in Winnebago County
Stream Flow	10:1 dilution ratio
Stream Classification	Warm Water Sport Fish (WWSF) community, non-public water supply
Discharge Type	Existing; Continuous
Annual Average Design Flow	0.078 MGD
Industrial or Commercial Contributors	None
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

Poygan Poy Sippi Sanitary District No. 1 serves a developed area on the south shore of Lake Poygan several miles west of Winneconne. Wastewater enters the plant through a comminutor and a backup bar screen. From there, it enters three aerated concrete lined lagoons. After receiving treatment in the lagoons, it passes through UV disinfection and is discharged to Lake Poygan.

Substantial Compliance Determination

Enforcement During Last Permit: A Notice of Noncompliance (NON) was sent in 2022 for missing/incomplete CMARs for the years of 2019 and 2020. The facility has completed all previously required actions as part of the enforcement process.

After a desktop review on 06/08/2026 of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on 03/24/2023, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Mark Stanek, Wastewater Engineer, on June 8, 2026.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
701	0.044 MGD (Avg. July 2019 – March 2026)	Influent - Representative samples shall be taken from the influent force main in the control building prior to the recycle pumps.
001	0.044 MGD (Avg. July 2019 – March 2026)	Effluent - Representative samples shall be taken from the effluent sampling box prior to the control weir except that grab samples shall be taken after the disinfection unit.
002	N/A – Lagoon System	Aeration Tank Sludge - Liquid sludge that accumulates in the treatment lagoons. Representative samples shall be collected from various depths and locations then composited for analysis.

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	
BOD ₅ , Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit

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

1.1.2 Explanation of Limits and Monitoring Requirements

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

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- Effluent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	45 mg/L	Weekly	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	61 lbs/day	Weekly	Calculated	
Suspended Solids, Total	Monthly Avg	37 lbs/day	Weekly	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	3/Week	Grab	
pH Field	Daily Min	6.0 su	3/Week	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September annually. See the E. coli Percent Limit permit section. Enter the result in the DMR on the last day of the month.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrogen, Ammonia (NH ₃ -N) Total	Daily Max - Variable	mg/L	Weekly	24-Hr Flow Prop Comp	See the Daily Maximum Ammonia Nitrogen (NH ₃ -N) Limits permit section.
Nitrogen, Ammonia (NH ₃ -N) Total	Weekly Avg	108 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies January-March.
Nitrogen, Ammonia (NH ₃ -N) Total	Weekly Avg	42 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies April-May.
Nitrogen, Ammonia (NH ₃ -N) Total	Weekly Avg	10 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies June-September.
Nitrogen, Ammonia (NH ₃ -N) Total	Weekly Avg	96 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies October-December.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	55 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies January-March.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	16 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies April-May.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	3.8 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies June-September.
Nitrogen, Ammonia (NH ₃ -N) Total	Monthly Avg	38 mg/L	Weekly	24-Hr Flow Prop Comp	Limit applies October-December.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	0.43 lbs/day	Weekly	Calculated	Monitoring only upon permit effective date. Final TMDL-based effluent mass limits go into effect per the Schedule. See Phosphorus TMDL permit section.
Phosphorus, Total	6-Month Avg	0.14 lbs/day	Weekly	Calculated	Monitoring only upon permit effective date. Final TMDL-based effluent mass limits go into effect per the Schedule. See Phosphorus TMDL permit section.
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.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See TMDL Calculations permit section.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only required January-December 2029.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring permit section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring permit section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring permit section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

2.1.1 Changes from Previous Permit

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

- Addition of TMDL-based effluent mass limits for total suspended solids (TSS) and calculated parameters for lbs/month and lbs/yr for reporting purposes.
- Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.
- Addition of TMDL-based effluent mass limits for phosphorus, to become effective October 1, 2029, per the Schedule. The calculated parameters for lbs/month and lbs/yr are retained from the previous permit for reporting purposes.
- The year in which chloride monitoring is required has been updated to 2029.
- Annual total nitrogen monitoring has been added and is required in specific quarters as outlined in the permit.

2.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 02/10/2025.

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. No changes have been made.

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. No changes have been made.

E. coli – Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020. Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. The permittee is required to disinfect, during the months of May – September each year. Disinfection requirements and E. coli limits of 126 #/100 mL as a monthly geometric mean that may not be exceeded and 410 #/100 mL as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month apply.

Total Maximum Daily Load (TMDL) Derived Limits for Total Phosphorus and Total Suspended Solids (TSS) – Upper Fox Wolf River Basin (UFW) TMDL Approved – Waste load allocations (WLAs) specified in TMDLs are expressed as QBELs (water quality-based effluent limits). The WLA-derived QBELs are consistent with the assumptions and requirements of the approved UFW TMDL. The UFW TMDL sets TSS and total phosphorus WLAs for dischargers throughout the project area. WLA-derived limits must be included in WPDES permits once the TMDL has been approved by US EPA (UFW TMDL approved in February 2020). Since WLAs are expressed as annual loads (lbs/yr), permits with TMDL-derived monthly average permit limits require the permittee to calculate and report rolling 12-month sums of total monthly loads for TSS and total phosphorus. Rolling 12-month sums can be compared directly to the annual WLA. The permittee can currently meet the TMDL-based effluent limits for TSS. A compliance schedule for meeting the TMDL-based effluent limits for total phosphorus is included in the reissued permit. An interim limit is needed when a compliance schedule is included in the permit to meet the TMDL limits. This limit should reflect a value which the facility is able to currently meet; however, it should also consider the receiving water quality, keeping the water from further impairment. The total phosphorus interim limit included in the permit is 1.0 mg/L expressed as a monthly average.

Total Nitrogen Monitoring (TKN, NO₂+NO₃, and Total N) – The Department has included effluent monitoring for total nitrogen in the permit through the authority under s. 283.55(1)(e), Wis. Stats. Testing is required during the following quarters: October – December 2026; July – September 2027; April – June 2028; January – March 2029; and October – December 2030.

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Liquid	Fecal Coliform	Incorporation	Land Application	N/A – Lagoon System
Does sludge management demonstrate compliance? Yes.						
Is additional sludge storage required? No.						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No.						
Is a priority pollutant scan required? N/A						

3.1 Sample Point Number: 002- Aeration Tank Sludge

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Per Application	Composite	
Nitrogen, Ammonium (NH ₄ -N) Total		Percent	Per Application	Composite	
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Monitoring required in 2027. Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
PFAS Dry Wt			Once	Grab	Monitoring required in 2027. Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

3.1.1 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.

- Removed PCB monitoring requirements. PCB monitoring may be required at the next permit reissuance.
- Monitoring for PFAS is required once (in 2027) pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.

3.1.2 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), Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6), Wis. Adm. Code, and in s. NR 204.07 (7), Wis. Adm. Code, for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code. Radium requirements are addressed in s. NR 204.07(3)(n), Wis. Adm. Code.

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

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

4 Schedules

4.1 TMDL-Based Effluent Mass Limits for Total Phosphorus

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

Required Action	Due Date
Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Wis. Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with final TMDL-based effluent mass limits for phosphorus, and a	09/30/2027

schedule for completing construction of the upgrades by the complete construction date specified below.	
Treatment Plant Upgrade: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Wis. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Wis. Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	03/31/2028
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2028
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	09/30/2029
Achieve Compliance: The permittee shall achieve compliance with final TMDL-based effluent mass limits for phosphorus.	10/01/2029

4.1.1 Explanation of Schedule

TMDL-Based Effluent Mass Limits for Total Phosphorus – This schedule is included in order to allow the permittee time to achieve compliance with the final TMDL-based effluent mass limits for total phosphorus by October 1, 2029.

4.2 Sludge Management Plan

A sludge management plan is required 60 days prior to sludge removal.

Required Action	Due Date
Sludge Management Plan Submittal: Submit a management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code. 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.	09/30/2027

4.2.1 Explanation of Schedule

Sludge Management Plan – A sludge management plan is required in order to show compliance with ch. NR 204, Wis. Adm. Code. The plan is due by the specified date. If lagoons are to be desludged, the plan must be received at least 60 days prior to sludge removal.

Attachments

WQBEL Memo: Water Quality-Based Effluent Limitations for Poygan Poy Sippi Sanitary District No. 1 WPDES Permit No. WI-0035513-07, by Nicole Krueger, Water Resources Engineer, dated 02/10/2025

Justification Of Any Waivers From Permit Application Requirements

No waivers from permit application requirements were requested or granted.

Prepared By: Sarah Donoughe, Wastewater Specialist-Adv

Date: June 10, 2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 02/10/2025

TO: Sarah Adkins – NER

FROM: Nicole Krueger – SER *Nicole Krueger*

SUBJECT: Water Quality-Based Effluent Limitations for Poygan Poy Sippi Sanitary District No. 1
WPDES Permit No. WI-0035513-07

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 Poygan Poy Sippi Sanitary District No. 1 in Winnebago County. This municipal wastewater treatment facility (WWTF) discharges to Lake Poygan, located in the Pine and Willow Rivers Watershed in the Wolf River Drainage Basin. This discharge is included in the Upper and Wolf River Basin TMDL as approved by EPA in February 2020. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD ₅			45 mg/L	30 mg/L		1
TSS TMDL			45 mg/L 61 lbs/day	30 mg/L 37 lbs/day		3
pH	9.0 s.u.	6.0 s.u.				1
Bacteria						4
<i>E. coli</i>				126 #/100 mL geometric mean		
Ammonia Nitrogen Jan – March April – May June – September October – Dec.	Variable Variable Variable Variable		108 mg/L 42 mg/L 10 mg/L 96 mg/L	55 mg/L 16 mg/L 3.8 mg/L 38 mg/L		1,5,6
Phosphorus Interim Final				0.7 mg/L 0.43 lbs/day	0.14 lbs/day	3,7
Chloride						1,8
TKN, Nitrate+Nitrite, and Total Nitrogen						9

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Upper Fox and Wolf Rivers Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA in February 2020.

4. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq \text{pH} \leq 6.1$	108	$7.0 < \text{pH} \leq 7.1$	66	$8.0 < \text{pH} \leq 8.1$	14
$6.1 < \text{pH} \leq 6.2$	106	$7.1 < \text{pH} \leq 7.2$	59	$8.1 < \text{pH} \leq 8.2$	11
$6.2 < \text{pH} \leq 6.3$	104	$7.2 < \text{pH} \leq 7.3$	52	$8.2 < \text{pH} \leq 8.3$	9.4
$6.3 < \text{pH} \leq 6.4$	101	$7.3 < \text{pH} \leq 7.4$	46	$8.3 < \text{pH} \leq 8.4$	7.8
$6.4 < \text{pH} \leq 6.5$	98	$7.4 < \text{pH} \leq 7.5$	40	$8.4 < \text{pH} \leq 8.5$	6.4
$6.5 < \text{pH} \leq 6.6$	94	$7.5 < \text{pH} \leq 7.6$	34	$8.5 < \text{pH} \leq 8.6$	5.3
$6.6 < \text{pH} \leq 6.7$	89	$7.6 < \text{pH} \leq 7.7$	29	$8.6 < \text{pH} \leq 8.7$	4.4
$6.7 < \text{pH} \leq 6.8$	84	$7.7 < \text{pH} \leq 7.8$	24	$8.7 < \text{pH} \leq 8.8$	3.7
$6.8 < \text{pH} \leq 6.9$	78	$7.8 < \text{pH} \leq 7.9$	20	$8.8 < \text{pH} \leq 8.9$	3.1
$6.9 < \text{pH} \leq 7.0$	72	$7.9 < \text{pH} \leq 8.0$	17	$8.9 < \text{pH} \leq 9.0$	2.6

6. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
7. The monthly average phosphorus limit functions as an interim limit for the phosphorus compliance schedule. This limit shall continue to be effective when the TMDL-based limits become effective.
8. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
9. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total kjeldahl nitrogen (TKN) (all expressed as N).

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

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

Attachments (3) – Narrative, Outfall Map, & 2019 Ammonia Calculations

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

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
Poygan Poy Sippi SD 1**

WPDES Permit No. WI-0035513-07

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

Poygan Poy Sippi Sanitary District #1 serves a developed area on the south shore of Lake Poygan several miles west of Winneconne. Wastewater enters the plant through a comminutor and a backup bar screen. From there, it enters three aerated concrete lined lagoons. After receiving treatment in the lagoons, it passes through UV disinfection and is discharged to Lake Poygan.

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

Existing Permit Limitations

The current permit, which expired on June 30, 2024, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅			45 mg/L	30 mg/L		2
TSS			45 mg/L	30 mg/L		
pH	9.0 s.u.	6.0 s.u.				2
Fecal Coliform May – September				400#/100 mL geometric mean		
Ammonia Nitrogen Jan – March April – May June – September October – Dec.	Variable Variable Variable Variable		108 mg/L 42 mg/L 10 mg/L 96 mg/L	55 mg/L 16 mg/L 3.8 mg/L 38 mg/L		3,4
Phosphorus MDV Interim Final				0.7 mg/L 0.120 mg/L	0.040 mg/L 0.026 lbs/day	
Chloride						1

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. Variable daily maximum ammonia limits:

Attachment #1

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 < pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

4. 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.

Receiving Water Information

- Name: Lake Poygan
- Waterbody Identification Code (WBIC): 242800
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. Note: Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Flow: A ten-to-one dilution ratio will be used for calculating effluent limitations based on chronic or long-term impacts, in accordance with s. NR 106.06(4)(b)2, Wis. Adm. Code, because the receiving water does not exhibit a unidirectional flow at the point of discharge.
- Hardness = 239 mg/L as CaCO₃. This value represents the geometric mean of data from chronic WET testing from 09/06/2006 and 09/24/2008.
- Source of background concentration data: Metals data from the Wolf River at New London is used for this evaluation because there is no data available for Lake Poygan. The Wolf River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. Chloride data is from Station ID 714002 at Lake Poygan. 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: North Lake Poygan SD also discharges to Lake Poygan; however they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: Lake Poygan is listed as 303(d) impaired for PCBs, total phosphorus, and total suspended solids.

Effluent Information

- Design flow rate(s):
 - Annual average = 0.078 MGD (Million Gallons per Day)
 - Peak daily = 0.698 MGD
 - Peak weekly = 0.146 MGD
 - Peak monthly = 0.114 MGD

Attachment #1

For reference, the actual average flow from 0.046 MGD was 07/01/2019 – 10/31/2024 MGD.

- Hardness = 239 mg/L as CaCO₃. This value represents the geometric mean of receiving water data from WET tests from Poygan Poy Sippi wastewater treatment facility from 09/06/2006 to 09/24/2008.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells.
- Additives: Alum is used for phosphorus removal.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Effluent Copper

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
11/17/2023	10	12/01/2023	12	12/15/2023	12
11/21/2023	12	12/05/2023	11	12/19/2023	9.9
11/24/2023	11	12/08/2023	12	12/22/2023	18
11/28/2023	10	12/12/2023	11		
1-day P ₉₉ = 17.9 µg/L					
4-day P ₉₉ = 14.6 µg/L					

Effluent Chloride Data

Sample Date	Chloride mg/L	Sample Date	Chloride mg/L	Sample Date	Chloride mg/L
12/06/2018	212	04/11/2023	174	09/12/2023	402
12/10/2018	222	05/17/2023	219	10/10/2023	427
12/13/2018	232	06/20/2023	281	11/13/2023	394
12/16/2018	225	07/11/2023	338	12/11/2023	392
02/20/2023	276	08/15/2023	376		
1-day P ₉₉ = 556 mg/L					
4-day P ₉₉ = 413 mg/L					

The following table presents the average concentrations and loadings at Outfall 001 from 07/01/2019 – 10/31/2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement
BOD ₅	12 mg/L*
TSS	13 mg/L*
pH field	7.8 s.u.
Phosphorus	0.47 mg/L

Attachment #1

	Average Measurement
Ammonia Nitrogen	5.1 mg/L*
Fecal Coliform	4.71 #/100 mL

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

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

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

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

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

10:1 dilution

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340		679.6	136	<14		
Cadmium	297	35.9	0.13	71.8	14.4	<0.3		
Chromium	297	4397	0.7	8795	1759	<1.3		
Copper	297	43.3	1.06	86.7			17.9	18
Lead	297	306	0.25	612	122	4.5		
Nickel	268	1080		2161	432	3.4		
Zinc	297	312	1.8	624	125	4.8		
Chloride (mg/L)		757	6	1514			556	427

* 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.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

10:1 dilution

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152		1674	335	<14	
Cadmium	175	3.82	0.13	40.7	8.1	<0.3	
Chromium	239	270	0.7	2959	592	<1.3	
Copper	239	21.8	1.06	229		14.6	

Attachment #1

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK- GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Lead	239	65.0	0.25	712	142	4.5	
Nickel	239	109		1200	240	3.4	
Zinc	239	258	1.8	2819	564	4.8	
Chloride (mg/L)		395	6	4285			413

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

Monthly Average Limits based on Wildlife Criteria (WC)

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

Monthly Average Limits based on Human Threshold Criteria (HTC)

10:1 dilution

SUBSTANCE	HTC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.13	4069	814	<0.3
Chromium (+3)	3818000	0.7	41997993	8399599	<1.3
Lead	140	0.25	1538	308	4.5
Nickel	43000		473000	94600	3.4

Monthly Average Limits based on Human Cancer Criteria (HCC)

10:1 dilution

SUBSTANCE	HCC	MEAN BACK- GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3		146	29.3	<14

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 not required.

Chloride – Considering available effluent data from the current permit term (12/06/2018 – 12/11/2023), the 1-day P₉₉ chloride concentration is 556 mg/L, and the 4-day P₉₉ of effluent data is 413 mg/L.

These effluent concentrations are below the calculated WQBELs for chloride, therefore no effluent limits are needed. **Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

Mercury – The permit application did not require monitoring for mercury because Poygan Poy Sippi is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3., Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, “there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5).” However, sludge sampling is not available because Poygan Poy Sippi is a recirculating sand filter and generates solids which are hauled away as septage. It is not expected that there are exceedances of the high-quality mercury concentration based on similar municipal treatment plants and the lack of industries. **No monitoring is recommended.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of discharge, the effluent flow rate, and the lack of indirect dischargers contributing to the collection system, **PFOS and PFOA monitoring is not recommended.** The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

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

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

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for municipal treatment plants.
- The maximum expected effluent pH has changed.

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

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

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

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 1949 sample results were reported from 07/02/2019 – 10/31/2024. The maximum reported value was 8.2 s.u. (Standard pH Units). The effluent pH was 8.1 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.1 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.1 s.u. Therefore, a value of 8.1 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 8.1 s.u. into the equation above yields an ATC = 7.0 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 the 1-Q₁₀ 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 based on the 2×ATC and 10:1 dilution calculations are shown below.

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	14
10:1 dilution	76

The current permit has variable daily maximum effluent limits based on effluent pH. Presented below is a table of daily maximum limitations corresponding to various effluent pH values.

Daily Maximum Ammonia Nitrogen Limits – WWSF

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

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.

The current weekly and monthly average limits are shown below:

Ammonia Limits

Months	Weekly Average	Monthly Average
January – March	108 mg/L	55 mg/L
April – May	42 mg/L	16 mg/L

Attachment #1

Months	Weekly Average	Monthly Average
June – September	10 mg/L	3.8 mg/L
October – December	96 mg/L	38 mg/L

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 07/01/2019 – 10/28/2024.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	January – March	April - May	June - September	October - December
1-day P ₉₉	30.9	21.1	12.3	15.7
4-day P ₉₉	22.0	11.4	9.17	8.51
30-day P ₉₉	17.4	5.89	4.27	4.51
Mean*	15.1	3.62	0.92	2.86
Std	5.16	4.41	4.89	3.26
Sample size	60	39	92	64
Range	6.15 - 28.6	0.055 - 17.6	<0.038 - 43.77	<0.04 - 14.3

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

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

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

Conclusions and Recommendations

In summary, 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. Additional limits to meet the requirements in s. NR 106.07, Wis. Adm Code, are shown below in bold.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
January – March	Variable	108 mg/L	55 mg/L
April – May	Variable	42 mg/L	16 mg/L
June – September	Variable	10 mg/L	3.8 mg/L
October – December	Variable	96 mg/L	38 mg/L

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

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

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

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

Effluent Data

Poygan Poy Sippi has monitored effluent *E. coli* from 05/03/2023 – 09/27/2023 and a total of 20 results are available. A geometric mean of 126 counts/100 mL was not exceeded with a maximum monthly geometric mean of 23.7 counts/100 mL. Effluent data has not exceeded 410 counts/100 mL. The maximum reported value was 28.1 counts/100 mL. Based on this effluent data, it **appears that Poygan Poy Sippi can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.**

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit

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

Because Poygan Poy Sippi SD 1 currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

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

TMDL Limits

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).

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

$$\begin{aligned}\text{TP Equivalent Effluent Concentration} &= \text{WLA} \div (365 \text{ days/yr} * \text{Flow Rate} * \text{Conversion Factor}) \\ &= 40 \text{ lbs/yr} \div (365 \text{ days/yr} * 0.078 \text{ MGD} * 8.34) \\ &= 0.17 \text{ mg/L}\end{aligned}$$

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

$$\begin{aligned}\text{TP 6-Month Average Permit Limit} &= \text{WLA} \div 365 \text{ days/yr} * \text{multiplier} \\ &= (40 \text{ lbs/yr} \div 365 \text{ days/yr}) * 1.30 \\ &= 0.14 \text{ lbs/day}\end{aligned}$$

$$\begin{aligned}\text{TP Monthly Average Permit Limit} &= \text{TP 6-Month Average Permit Limit} * 3 \\ &= 0.14 \text{ lbs/day} * 3 \\ &= 0.43 \text{ lbs/day}\end{aligned}$$

The multiplier used in the six-month average calculation was determined according to the implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.7. This is the standard deviation divided by the mean of mass data. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

Six-month average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to concentrations of 0.22 mg/L and 0.66 mg/L, respectively, at the facility design flow of 0.078 MGD.

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

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

Effluent Data

The following table summarizes the effluent phosphorus data from the current permit term (07/01/2019 – 10/28/2024). Data prior to 10/01/2019 was removed in this evaluation because it is not representative of current conditions due to the use of alum to reduce phosphorus effluent. Mass data from 11/07/2022 was not included either due to the reported flow rate of 0.85 MGD which is higher than the peak daily design flow so it is not representative of normal conditions.

Total Phosphorus Statistics		
	Concentration (mg/L)	Mass Discharge (lbs/day)
1-day P ₉₉	0.95	0.49
4-day P ₉₉	0.62	0.29
30-day P ₉₉	0.46	0.19
Mean	0.38	0.14
Std	0.17	0.10
Sample Size	243	242
Range	0.02 – 0.968	0.0056 – 0.647

An interim limit is needed when a compliance schedule is included in the permit to meet the TMDL limits. This limit should reflect a value which the facility is able to currently meet; however, it should also consider the receiving water quality, keeping the water from further impairment. **It's recommended that the interim limit be set equal to 0.7 mg/L, expressed as a monthly average.** This value reflects the current MDV interim limit. **This limit is recommended to continue after the TMDL-based mass limits become effective for antibacksliding purposes per ch. NR 207, Wis. Adm. Code.**

Poygan Poy Sippi is currently covered under the MDV and has not reapplied because the facility believes the TMDL limits can be met through treatment.

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).

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

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

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

$$\text{TSS Monthly Average Permit Limit} = \text{WLA} \div 365 \text{ days/yr} * \text{multiplier}$$

$$\begin{aligned}
 & \text{Attachment \#1} \\
 & = (7,129 \text{ lbs/yr} \div 365 \text{ days/yr}) * 1.90 \\
 & = 37 \text{ lbs/day}
 \end{aligned}$$

$$\begin{aligned}
 \text{TSS Weekly Average Permit Limit} & = \text{WLA} \div 365 \text{ days/yr} * \text{multiplier} \\
 & = (7,129 \text{ lbs/yr} \div 365 \text{ days/yr}) * 3.11 \\
 & = 61 \text{ lbs/day}
 \end{aligned}$$

The multiplier used in the weekly average and monthly average calculation was determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 1.9. This is the standard deviation divided by the mean of mass data. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies TSS monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

Weekly average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to a concentration of 93 mg/L and 57 mg/L, respectively, at the facility design flow of 0.078 MGD.

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

Effluent Data

The following table summarizes effluent total suspended solids monitoring data from 07/01/2019 – 10/28/2024. Mass data from 11/07/2022 was not included due to the reported flow rate of 0.85 MGD which is higher than the peak daily design flow so it is not representative of normal conditions.

Total Suspended Solids Effluent Data

	TSS mg/L	TSS lbs/day
1-day P ₉₉	45.4	21.2
4-day P ₉₉	26.8	11.9
30-day P ₉₉	17.3	7.08
Mean*	13.0	5.01
Std	8.9	4.24
Sample size	255	251
Range	<2 - 45.3	0 – 21.5

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

Poygan Poy Sippi can currently meet the TSS mass limits and a compliance schedule is not needed. The current concentration limits of 45 mg/L as a weekly average and 30 mg/L as a monthly average are recommended to continue in the reissued permit per antibacksliding purposes per ch. NR 207, Wis. Adm. Code.

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.

Due to the amount of available dilution in the limit calculation, the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code).

The table below summarizes the maximum temperatures reported during monitoring from 07/01/2011 – 09/30/2011.

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			NA	120
FEB			NA	120
MAR			NA	120
APR			NA	120
MAY			NA	120
JUN			NA	120
JUL	82	83	NA	120
AUG	78	80	NA	120
SEP	71	75	NA	120
OCT			NA	120
NOV			NA	120
DEC			NA	120

Reasonable Potential

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

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

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- 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

There is not temperature data for October – June. However, at temperatures above approximately 103° F, conventional biological treatment systems do not function properly and experience upsets. There is no indication that this has ever occurred in this treatment system. Therefore, there is no reasonable potential for the discharge to exceed this limit. **No monitoring or effluent limits are recommended for temperature.**

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 LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 9% 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:

The IWC is 9% based on dilution of 10 parts lake water to 1-part effluent, as specified in s. NR 106.06(4)(b)2, Wis. Adm. Code, or a factor of 1 in 11 to calculate the IWC.

- 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.

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- 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.

WET Data History

Date Test Initiated	Acute Results LC ₅₀ %				Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	
09/06/2006	>100	>100	Pass	Yes	
09/24/2006	>100	>100	Pass	No	1

Footnotes:

- 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.**

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

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

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

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

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: <https://dnr.wisconsin.gov/topic/Wastewater/WET.html>.

WET Checklist Summary

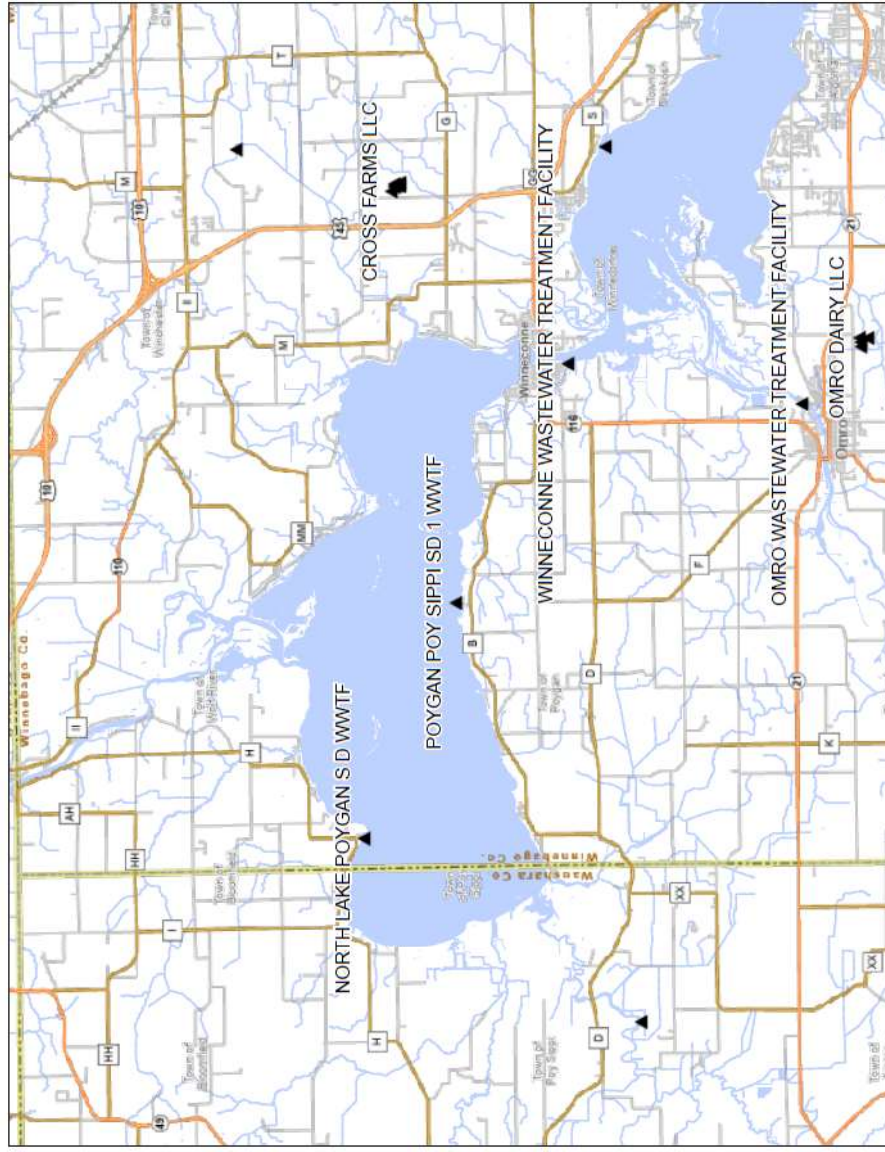
	Acute	Chronic
AMZ/IWC	Not Applicable.	IWC = 9%.

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	Acute	Chronic
	0 Points	0 Points
Historical Data	2 tests used to calculate RP, over 5 years old. No tests failed. 5 Points	0 tests used to calculate RP. 5 Points
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. 0 Points	Same as Acute. 0 Points
Receiving Water Classification	Warmwater sport fish. 5 Points	Same as Acute. 5 Points
Chemical-Specific Data	No reasonable potential for limits based on ATC; Ammonia nitrogen limit carried over from the current permit. Lead, nickel, zinc, chloride, and ammonia detected. Additional Compounds of Concern: None. 3 Points	Reasonable potential for limits for ammonia based on CTC. Lead, nickel, zinc, and chloride detected. Additional Compounds of Concern: None. 8 Points
Additives	1 Water Quality Conditioner added. Permittee has proper P chemical SOPs in place. 1 Point	All additives used more than once per 4 days. 1 Point
Discharge Category	0 Industrial Contributors. 0 Points	Same as Acute. 0 Points
Wastewater Treatment	Secondary or Better. 0 Points	Same as Acute. 0 Points
Downstream Impacts	No impacts known. 0 Points	Same as Acute. 0 Points
Total Checklist Points:	14 Points	19 Points
Recommended Monitoring Frequency (from Checklist):	No tests needed.	No tests needed.
Limit Required?	No	No
TRE Recommended? (from Checklist)	No	No

- No WET testing is required because information related to the discharge indicates the potential for effluent toxicity is believed to be low.

Poygan Poy Sippi Outfall Map



Map projection: NAD 1983 HARN Wisconsin TM

Service Layer Credits:
Latest Leaf Off Imagery - Basic Basemap (Cached):

Map: 0 10,000 20,000 Feet
0 3,000 6,000 Meters

This map is a product generated by a DNS web mapping application.
This map is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. The user is solely responsible for verifying the accuracy of information before using for any purpose. By using this product for any purpose user agrees to be bound by all disclaimers found here: <https://dnr.wisconsin.gov/info>.

Legend:
▲ Surface Water Outfalls
— Rivers and Streams
--- Intermittent Streams
□ Open Water
Latest Leaf Off Imagery
Red: Band_1
Green: Band_2
Blue: Band_3

Notes:
Not to scale



Date Printed: 1/14/2025 8:46 AM

Attachment #3
2019 Ammonia Calculations

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

Ammonia limits were last calculated in 10/07/2011. At that time, default temperatures and site-specific pH monitoring data were used to calculate limits. Additional pH monitoring data from Lake Poygan is available and warrants re-calculation of weekly and monthly average limits due to expression of limit requirements. The new ambient pH values are used in conjunction with the effluent and default lake temperature values to re-calculate limits using the procedure in s. NR 106.32, Wis. Adm. Code.

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria.

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 to derive weekly average limitations, and the 30-day criteria are used to derive monthly average limitations, both by a mass-balance using a ten-to-one dilution ratio.

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 believed to be present in the Lake Poygan, based on conversations with local fisheries biologists. So “ELS Absent” criteria apply from October through December, and “ELS Present” criteria will apply from January to September for a WWSF classification.

Since minimal ambient data is available, the “default” basin assumed values are used for Temperature and background ammonia concentrations, shown in the table below, with the resulting criteria and effluent limitations. Ambient pH data submitted as part of a 2011 report titled “Ammonia Evaluation Report”, pH data from SWIMS station #713279, and previous in-lake pH monitoring data was used for this evaluation.

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		Winter Jan. – Mar.	Spring April & May	Summer June – Sept.	Winter Oct. – Dec.
Effluent Flow	Qe (MGD)	0.078	0.078	0.078	0.078
Background Information	Ammonia (mg/L)	0.11	0.04	0.03	0.03
	Temperature (°C)	3	11	27	6
	pH (s.u.)	7.3	8.3	8.6	7.8
Criteria mg/L	4-day Chronic				
	Early Life Stages Present	12.69	3.81	1.03	
	Early Life Stages Absent				8.77
	30-day Chronic				
	Early Life Stages Present	5.08	1.52	0.41	
Effluent Limitations mg/L	Early Life Stages Absent				3.51
	Weekly Average				
	Early Life Stages Present	139	42	11	
	Early Life Stages Absent				96
	Monthly Average				
	Early Life Stages Present	55	16	4.2	
	Early Life Stages Absent				38

Section NR 106.33(2) was also updated effective September 1, 2016. As a result, seasonal 20 and 40 mg/L thresholds for including ammonia limits in municipal discharge permits are no longer applicable under current rules. As such, s. NR 106.33(1) enables the Department to determine the need to include ammonia limits in municipal discharge permits based on the statistical comparisons in s. NR 106.05.

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 07/21/2014 to 12/25/2018, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Poygan Poy Sippi SD 1 permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P₉₉) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

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.

Based on this comparison, no additional limits are required.

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Ammonia Nitrogen mg/L	January - March	April - May	June - September	October - December
1-day P ₉₉	25.2	19.3	6.3	12.4
4-day P ₉₉	17.0	10.5	4.0	6.7
30-day P ₉₉	12.8	5.3	1.7	3.2
Mean*	10.8	3.1	0.58	1.8
Std	4.47	4.18	1.8	2.7
Sample size	48	32	75	59
Range	<0.049-19	<0.049-19	<0.049-8.73	<0.049-12.6

Antidegradation:

The calculated monthly average limit of 4.2 mg/L and weekly average limit of 11 mg/L for June-September is less restrictive than the monthly average and weekly average limits of 3.8 mg/L and 10 mg/L 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 limits of 3.8 mg/L and 10 mg/L should be continued in the reissued permit.

Conclusions and Recommendations:

In summary, the daily maximum effluent limit should be continued in the reissued permit along with the weekly and monthly average limits from June – September. No additional ammonia limits are recommended based on reasonable potential. No mass limitations are recommended in accordance with s. NR 106.32(5). Additional ammonia limits to comply with expression of limit requirements are included in Part 7 of this document.