Permit Fact Sheet

General Information

Permit Number:	WI-0022055-09-0	
Permittee Name:	City of Princeton	
Address:	531 S. Fulton St.	
City/State/Zip:	Princeton WI 54968	
Discharge Location	5000 feet southeast of facility. The discharge point is on the north bank of the Fox River, 280 ft. south of CTH D and 25 feet downstream of the railroad bridge.	
Receiving Water	Fox River	
Stream Flow ($Q_{7,10}$)	301 cfs	
Designated Uses	Fish and aquatic life biological use (warm water sport fish community in the Great Lakes Basin), recreation and non-public water supply	
Design Flow(s)	Annual Average	0.260 MGD
Significant Industrial Loading?	No significant industrial loading	
Operator at Proper Grade?	Facility Classification & Subclasses: Yes - Municipal systems all require the SS Subclass. Princeton currently only has basic classification in subclasses: A4 – Ponds, Lagoons and Natural Systems; and L – Laboratory Operator-in-Charge Certification: Ernest Schmidt has Basic level certification in subclasses A4 and L.	
Pretreatment Program Approval Date	N/A	

Facility Description

The City of Princeton, in Green Lake County, operates an Aerated Lagoon wastewater treatment facility (WWTF) designed for an average annual flow of 0.26 MGD. Princeton wastewater collected in the system is all pumped through the Main Lift station and goes to the WWTF. At the Main Lift Station there is a sampler for taking influent samples, a grinder, a grit pump and grit chamber for grit removal, and the flowmeter. The WWTF consists of three ponds including two aerated lagoons and one settling pond. Once effluent passes out of the polishing lagoon by means of a telescoping valve it travels through the chlorine contact chamber. Treated effluent from the WWTF is discharged to the Fox River. The WWTF is located on a hill to the northwest of the City where it is not subject to flooding. Influent must be pumped to it by means of a lift station. All lagoons were synthetically lined in 2004 and sludge has yet to accumulate to the point of requiring removal.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on September 29 2022, this facility has been found to be in substantial compliance with their current permit.

Enforcement During Last Permit: Review of the monthly discharge monitoring reports submitted by Princeton's wastewater treatment plant identified continuing violations, for the period of January 3, 2023, through March 28, 2023, of the total phosphorus monthly average limit of 4.1 mg/L as well as continuing violations of the total ammonia nitrogen weekly average limits of 17 mg/L. However, the facility responded in writing on May 22, 2023, with updated numbers showing that the facility has returned into compliance.

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		Influent - Representative influent samples shall be collected from the main lift station prior to the comminutor & bar screen.
001	0.26 MGD (Avg. 7/1/2017 – 2/28/2022)	Effluent - Representative effluent samples shall be collected prior to the chlorine contact tank except that grab samples shall be collected at the end of the chlorine contact tank.
002	Not removed on a regular basis. Lagoon system.	Lagoon Sludge - Liquid sludge that accumulates in the lagoons. Representative samples shall be composited from each cell and compliance with the requirements of s. NR 204, Wisconsin Administrative Code, shall be assured prior to any disposal of sludge. Results of sludge analyses shall be reported on form 3400-49 "Waste Characteristics Report".

1 Influent – Monitoring Requirements

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

Changes from Previous Permit:

No Changes.

Explanation of Limits and Monitoring Requirements

BOD5 and Total Suspended Solids: Influent monitoring is needed to assess loading to the facility and treatment performance. Requirements for flow, BOD, and TSS are established in accordance with ch. NR 210.04(2), Wis. Adm. Code.

2 Surface Water - Monitoring and Limitations

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	Monthly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
BOD5, 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	45 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	65.9 lbs/day	Weekly	Calculated	This is a final TMDL limit effective immediately. See TMDL section.
Suspended Solids, Total	Weekly Avg	108 lbs/day	Weekly	Calculated	This is a final TMDL limit effective immediately. See TMDL section.
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of TSS and report on the last day of the month on the DMR. See TMDL Calculations section below.
Suspended Solids, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of TSS discharged and report on the last day of the month on the DMR. See TMDL Calculations section below.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Chlorine, Total Residual	Daily Max	38 ug/L	5/Week	Grab	Monitoring and limits apply whenever chlorine is added.
Chlorine, Total Residual	Monthly Avg	38 ug/L	5/Week	Grab	Monitoring and limits apply whenever chlorine is added.
Chlorine, Total Residual	Weekly Avg	38 ug/L	5/Week	Grab	Monitoring and limits apply whenever chlorine is added.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit Effective May through September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit Effective May through September annually. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.
Phosphorus, Total	Monthly Avg	3.9 mg/L	Weekly	24-Hr Flow Prop Comp	This is an interim MDV limit effective through June 30, 2028. See the MDV/Phosphorus subsections and phosphorus schedules.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Weekly	24-Hr Flow Prop Comp	This is an interim MDV limit effective on July 1, 2028. See the MDV/Phosphorus subsections and phosphorus schedules.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the total monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See Standard Requirements for 'Appropriate Formulas' to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the total monthly discharges (for the months that the MDV is in effect) for the calendar year on the Annual report form.
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	See Table	Look up the variable ammonia limit from the 'Variable Ammonia Limitation' table in the ammonia section below and report the variable limit in the Ammonia Variable Limit column on the

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	24-Hr Flow Prop Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation Section
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	17 mg/L	2/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	17 mg/L	2/Week	24-Hr Flow Prop Comp	
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Monitoring Series section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Monitoring Series section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Monitoring Series section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

Changes from Previous Permit

Total Suspended Solids TMDL Limits- Mass based TSS limits of 108 lbs/day weekly average and 65.9 lbs/day as a monthly average have been added to the permit to comply with requirements of the Upper Fox Wolf River TMDL. Effluent concentration (mg/L) shall be monitored and reported weekly upon permit reissuance and will be used to calculate amounts reported for mass-based limits. An additional reporting requirement for lbs/month will be used to calculate the facility's 12-month rolling sum of total monthly discharge, which can be compared directly to the facility's designated WLA.

E.coli: Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

Total Phosphorus: A monthly average interim limit of 3.9 mg/L is effective until June 30, 2028 and after a compliance schedule a monthly average interim limit of 1.0 mg/L is effective.

Nitrogen, Ammonia (NH3-N) Total: The sample frequency for this parameter has been increased to 2/Week.

Total Nitrogen Monitoring (TKN, N02+N03 and Total N): Annual monitoring in rotating quarters throughout the permit term was added to the proposed permit.

Whole Effluent Toxicity (WET) Testing: No testing requirements this permit term.

Explanation of Limits and Monitoring Requirements

Please refer to the Water Quality Based Effluent Limitations memo for the Princeton Wastewater Treatment Facility prepared by Nicole Krueger dated May 2, 2022, and used for this reissuance.

BOD_5, TSS, and pH: No changes are recommended in the categorical permit limitations for BOD_5, TSS and pH. Because the 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. Where the receiving water is classified as fish and aquatic life (Warm Water Sport Fish in this case) as defined in s. NR 102.04(3)(b), Wis. Adm. Code the categorical limits for BOD_5, TSS, and pH are those limits enumerated in ss. NR 210.05(1)(a)-(c), Wis Adm. Code.

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

E. coli limits of 126 #/100 ml as a monthly geometric mean that may not be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply.

Upper Fox Wolf River Total Maximum Daily Load (TMDL): The permitted facility is located within the Upper Fox Wolf River Basin Total Maximum Daily Load (UFWRB TMDL), which was approved by EPA February 27, 2020. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amounts of phosphorus and total suspended solids that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from and comply with the applicable water quality criterion and are consistent with the assumptions and requirements of the EPA-approved WLAs in the TMDL, which are 135 lbs/yr for phosphorus and 12,671 lbs/yr for TSS for the permitted facility.

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

For phosphorus, continuously discharging facilities covered by the UFWRB TMDL are given monthly average mass limits. If the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits (averaging period of May through October and November through April) are also included. The equivalent effluent concentration of 3.9 mg/L was calculated for the facility, thus, TMDL based mass limits are expressed as a monthly average.

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

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

Phosphorus: Phosphorus rules became effective December 1, 2010 per NR 217, Wis. Adm. Code, that required the permittee to comply with water quality based effluent limits (WQBELs) for total phosphorous. The final phosphorus WQBELs are 0.48 lbs/day as a 6-month rolling average, and a monthly average of 1.4 lbs/day from the UFWRB TMDL. For this permit term, the permittee has applied for the Multi-Discharger Variance (MDV) for phosphorus as provided for in s. 283.16, Wis. Stats., and approved by USEPA on February 6, 2017 for a 10-year duration. The permittee qualifies for the MDV because it is an existing source and a major facility upgrade is needed to comply with the applicable phosphorus WQBELs, thereby creating a financial burden. The interim effluent limit for total phosphorus is 3.9 mg/L as an average monthly limit until June 30, 2028 at which point a monthly average limit of 1.0 mg/L becomes effective on July 1, 2028.

Conditions of the MDV require the permittee to optimize phosphorus removal throughout the proposed permit term, comply with interim limits and make annual payments to participating county(s) by March 1 of each year based on the pounds of phosphorus discharged during the previous year in excess of the specified target value. A reopener clause is included in the permit to address the current MDV's expiration date, as a permit action may be required to update or remove variance provisions if the MDV is altered or unavailable after February 6, 2027.

The "price per pound" value is $64.75 adjusted for CPI annually during the first quarter as defined by s. 283.16(8)(a)2, Wis. Stats and takes effect for reissued permits with effective dates starting April 1. This may differ from the "price per pound" that is public noticed; however, the "price per pound" is set upon reissuance and is applicable for the entire permit term. The participating county(s) uses these payments to implement non-point source phosphorus control strategies at the watershed level.

Ammonia: Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106, Wis. Adm. Code establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N): The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019.

PFAS: Based on information available at the time the proposed permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA in their effluent as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

Monitoring Frequency: 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 fairness and 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 Department has been revisiting the sampling frequencies at every facility to evaluate whether current frequencies are appropriate of if an increase is warranted. The frequencies for pH and phosphorus were increased to align Princeton with other facilities of similar size to ensure fairness and in consideration of department guidance of sample frequencies.

Requirements in administrative code (NR 108, 205, 210 and 214 Wis. Adm. Code) and Section 283.55, Wis. Stats., were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. The department has determined at this time that the aforementioned changes in monitoring frequency are warranted based on the size and type of the facility.

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	Lagoon	Land Application	Lagoon
Does sludge management demonstrate compliance? **Yes**						
Is additional sludge storage required? **No**						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? **Yes, the City of Princeton has a radium removal system for its water supply.**						
Is a priority pollutant scan required? **No**						

Sample Point Number: 002- Lagoon 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	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Analysis required 2025. See the "Sludge Analysis for PCBs" section and the Standard Requirements for more information.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Analysis required 2025. See the "Sludge Analysis for PCBs" section and the Standard Requirements for more information.
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Weight			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

PCB: Monitoring for PCBs in the year 2025 has been added to the proposed permit.

PFAS: One time sludge monitoring is included in the permit pursuant s. NR 204.06(2)(b)9, Wis. Adm. Code.

Explanation of Limits and Monitoring Requirements

Requirements for 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 is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS”.

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 the proposed WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9, Wis. Adm. Code.

PCB: PCBs are not expected to be present due to the lack of any industrial or commercial discharges. Pursuant to s. NR 204.06(2)(c), Wis Adm. Code, PCB monitoring may be included with a monitoring frequency of 'once' every other permit term.

Water Extractable Phosphorus: Water extractable phosphorus (WEP) is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

4 Schedules

4.1 Sludge Management Plan

Required Action	Due Date
Submit a Sludge Management Plan: The permittee shall submit an update to the management plan for approval if removal of sludge will occur during this permit term. The plan shall demonstrate compliance with ch. NR 204 Wis. Adm. Code and at minimum address 1) How and where is sludge sampled; 2) Available sludge storage details and location(s); 3)How will the sludge be removed with details on volume, characterization and how will the treatment plant continue to function during the drawdown; 4) Describe the type of transportation and spreading vehicles and loading and unloading practices; 5) Identify approved land application sites, apply for needed sites, site limitations, total acres needed and vegetative cover management; 6) Specify record keeping procedures including site loading; 7) Address contingency plans for adverse weather and odor/nuisance abatement; and 8) Include any other pertinent information such as other disposal options that may be used or specifications of any pretreatment processes Once approved, all sludge management 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. No desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed. Updated sludge management plan shall be submitted at least 60 days prior to land application of sludge.	

Explanation of Schedule

If the permittee wishes to land apply sludge from the lagoons during the permit term, they must submit a plan detailing how the sludge will be handled and where it will be applied for the Department to approve. The plan must be submitted at least 60 days prior to the sludge being applied.

4.2 Phosphorus Multi-Discharger Variance Interim Limit (1.0 mg/L)

The permittee shall comply with the 1.0 mg/L MDV interim effluent limit by the end of this compliance schedule.

Required Action	Due Date
Submit Final Compliance Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code. The permittee may submit an abbreviated facility plan if the modifications are determined to be minor according to the Department.	12/31/2024
Submit Plans & 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 the interim phosphorus effluent limit and a schedule for completing construction of the upgrades by the 'Complete Construction' date specified below.	06/30/2025
Treatment Plant Upgrade: Upon approval of the final construction plans and schedule by the Department and pursuant to s. 281.41, Wis. Stats., the permittee shall initiate construction of the treatment plant upgrades in accordance with the approved plans and specifications.	06/30/2026
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	06/30/2027
Complete Construction and Achieve Compliance: The permittee shall complete construction and achieve compliance with the phosphorus interim effluent limit of 1.0 mg/L.	06/30/2028

Explanation of Schedule

Subsection 283.16(6), Wis. Stats., establishes required interim phosphorus effluent limits that must be met for multi-discharger variance (MDV) eligibility. Subsection 283.16(6)(am), Wis. Stats., allows a technology based phosphorus limit of 1.0 mg/L as the MDV interim limit if a permittee certifies that its treatment facility cannot achieve compliance with the MDV interim limit without a major facility upgrade. The permittee qualifies for a 1.0 mg/L total phosphorus MDV interim limit and the schedule above provides the permittee with four years to comply with that limit.

4.3 Phosphorus Schedule - Optimization Plan

The permittee is required to optimize performance to control phosphorus discharges per the following schedule.

Required Action	Due Date
Optimization Plan: The permittee shall prepare an Optimization Plan and submit it for Department approval. The plan shall include an evaluation of collected effluent data, possible source reduction measures and operational improvements to optimize performance to control phosphorus discharges. The plan shall contain a schedule for implementation of the measures and improvements. Once the plan is approved by the Department, the permittee shall take the steps called for in the Optimization Plan and follow the schedule of implementation as approved.	06/30/2024
Progress Report #1: Submit a progress report on optimizing removal of phosphorus.	06/30/2025
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	06/30/2026
Progress Report #3: Submit a progress report on optimizing removal of phosphorus. This schedule item is contingent upon continued federal authorization of the MDV. See "MDV Reopener Clause" in the Surface Water section of this permit.	06/30/2027

Progress Report #4: Submit a progress report on optimizing removal of phosphorus. This schedule item is contingent upon continued federal authorization of the MDV. See "MDV Reopener Clause" in the Surface Water section of this permit.	06/30/2028

Explanation of Schedule

Per s. 283.16(6)(a), Wis. Stats. the Department may include a requirement that the permittee optimize the performance of a point source in controlling phosphorus discharges, which may be necessary to achieve compliance with multi-discharger variance interim limits. This compliance schedule requires the permittee to prepare an optimization plan with a schedule for implementation and submit it for Department approval. The permittee shall take the steps called for in the optimization plan and submit annual progress reports on optimizing the removal of phosphorus.

4.4 Phosphorus Payment per Pound to County

The permittee is required to make annual payments for phosphorus reductions to the participating county or counties in accordance with s. 283.16(8), Wis. Stats, and the following schedule. The price per pound will be set at the time of permit reissuance and will apply for the duration of the permit.

Required Action	Due Date
Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of each calendar year. The amount due is equal to the following: $64.75 per pound or $640,000, whichever is less. See the payment calculation steps in the Surface Water section. The permittee shall submit Form 3200-151 to the Department by March 1 of each calendar year indicating total amount remitted to the participating counties to verify that the correct payment was made. The first payment verification form is due by the specified Due Date. Note: The applicable Target Value is 0.2 mg/L as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is $50.00 adjusted for CPI.	03/01/2025
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2026
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2027
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2028
Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2029
Continued Coverage: If the permittee intends to seek a renewed variance, an application for the MDV (Multi Discharger Variance) shall be submitted as part of the application for permit reissuance in accordance with s. 283.16(4)(b), Wis. Stats.	
Annual Verification of Payment After Permit Expiration: In the event that this permit is not reissued prior to the expiration date, the permittee shall continue to submit Form 3200-151 to the Department indicating total amount remitted to the participating counties by March 1 each year.	

Explanation of Schedule

Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce non-point sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the "Payment to Counties" watershed option described in s. 283.16(8), Wis. Stats. Under this option the permittee shall make annual payment(s) to participating county(s) that are calculated based on the amount of phosphorus actually discharged during a calendar year in pounds per year less the amount of phosphorus that would have been discharged had the permittee discharged phosphorus at a target value concentration of 0.2 mg/L. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal $64.75 per pound. This schedule requires the permittee to submit Form 3200-151 to the Department indicating the total amount remitted to the participating county(s).

Attachments:

Water Quality-Based Effluent Limitations – 05/02/2022

Phosphorus Multi-discharger Variance Application for Municipal Facilities – 07/12/2023

Multi-discharger Variance Evaluation Checklist – 08/21/2023

Conditional Approval of the Multi-discharger Phosphorus Variance – 08/21/2023

Public Notice

Expiration Date:

June 20, 2029

Justification Of Any Waivers From Permit Application Requirements

No waivers from permit application requirements granted.

Prepared By: Sarah Adkins, Wastewater Specialist

Date: May 16, 2024

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 05/02/2022

TO: Heidi Schmitt Marquez – NER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for the Princeton Wastewater Treatment Facility WPDES Permit No. WI-0022055-09

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Princeton wastewater treatment facility in Green Lake County. This municipal wastewater treatment facility (WWTF) discharges to the Fox River, located in the Fox River/Berlin Watershed in the Upper Fox River Basin. This discharge is included in the Upper Fox and Wolf River Basin TMDL as approved by EPA. 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			45 mg/L 108 lbs/day	30 mg/L 65.9 lbs/day		1,3
pH	9.0 s.u.	6.0 s.u.				1
Residual Chlorine	38 µg/L		38 µg/L	38 µg/L		1
Bacteria						4
E. coli				126 #/100 mL geometric mean		
Ammonia Nitrogen	Variable		17 mg/L	17 mg/L		5
Phosphorus LCA Interim Limit HAC Interim Limit Final WQBEL				 3.9 mg/L 1.0 mg/L 1.4 lbs/day	 0.48 lbs/day	3,6
TKN, Nitrate+Nitrite, and Total Nitrogen						7

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

6. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 3.9 mg/L should be effective upon permit reissuance. A compliance schedule may be included in the permit until the highest attainable condition (HAC) limit of 1.0 mg/L can be met. The TMDL limits remain at 1.4 lbs/day as a monthly average and 0.48 lbs/day as a six-month average.
7. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).

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

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

Attachments (3) – Narrative, Map, & Thermal Table

PREPARED BY: Nicole Krueger, Water Resources Engineer

E-cc: Barti Oumarou, Wastewater Engineer – NER
Heidi Schmitt Marquez, Regional Wastewater Supervisor – NER
Diane Figiel, Water Resources Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Princeton Wastewater Treatment Facility

WPDES Permit No. WI-0022055-09

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The City of Princeton, in Green Lake County, operates an Aerated Lagoon wastewater treatment facility (WWTF). The WWTF consists of two ponds with a subsurface aeration system and a third pond for effluent polishing. All lagoons are synthetically lined. Once effluent passes out of the polishing lagoon by means of a telescoping valve it travels through the chlorine contact chamber. Treated effluent from the WWTF is discharged to the Fox River.

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

Existing Permit Limitations

The current permit, expiring on 06/30/2022, 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		2
pH	9.0 s.u.	6.0 s.u.				2
Residual Chlorine	38 µg/L		38 µg/L	38 µg/L		
Fecal Coliform May – September			656#/100 mL geometric mean	400#/100 mL geometric mean		
Ammonia Nitrogen	Variable		17 mg/L	17 mg/L		3
Phosphorus Interim Final				 4.1 mg/L 0.3 mg/L	 0.1 mg/L	4
Acute WET						5

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. Ammonia daily maximum limits:

Effluent pH - s.u.	**NH_3-N Limit – mg/L**	**Effluent pH - s.u.**	**NH_3-N Limit – mg/L**
$pH \leq 7.9$	> 17	$8.4 < pH \leq 8.5$	6.4
$7.9 < pH \leq 8.0$	17	$8.5 < pH \leq 8.6$	5.3
$8.0 < pH \leq 8.1$	14	$8.6 < pH \leq 8.7$	4.4

8.1 < pH ≤ 8.2	11	8.7 < pH ≤ 8.8	3.7
8.2 < pH ≤ 8.3	9.4	8.8 < pH ≤ 8.9	3.1
8.3 < pH ≤ 8.4	7.8	8.9 < pH ≤ 9.0	2.6
		9.0 < pH	< 2.6

4. A compliance schedule is in the current permit to meet the final WQBEL by 07/01/2026.
5. Acute WET testing is required twice during the permit term.

Receiving Water Information

- Name: Fox River
- Waterbody Identification Code (WBIC): 117900
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. Note: Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS for Station 04073365, just upstream of where Outfall 001 is located.
  7-Q_{10} = 301 cfs (cubic feet per second)
  7-Q_2 = 403 cfs
  Harmonic Mean Flow = 429 cfs using a drainage area of 962 mi^2
  The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).
  The previous low flows were more conservative because the flows used were from a station upstream of Puckaway Lake
- Hardness = 195 mg/L as $CaCO_3$. This value represents the geometric mean of data from WET testing from Green Lake Sanitary District and Princeton WWTF from 07/23/1997 – 08/28/2008.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Source of background concentration data: Metals data from the Fox River is used for this evaluation. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: There are several other dischargers to the Fox River, however they are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The immediate receiving water is not 303(d) listed as impaired. The Fox River downstream of Lake Winnebago is 303(d) listed as impaired for PCBs and total phosphorus.

Effluent Information

- Design flow rate(s):
  Annual average = 0.26 MGD (Million Gallons per Day)
  For reference, the actual average flow from 07/01/2017 to 02/28/2022 was 0.21 MGD.
- Hardness = 273 mg/L as $CaCO_3$. This value represents the geometric mean of data from the permit reissuance application from 01/01/2022 to 01/10/2022.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells.

- Additives: Sulfuric acid is added for pH control.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Effluent Data

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
01/01/2022	13	01/13/2022	8	01/25/2022	7
01/04/2022	7	01/16/2022	6	01/28/2022	10
01/07/2022	17	01/19/2022	6	01/31/2022	7
01/10/2022	7	01/22/2022	6		
1-day P_{99} = 20 µg/L					
4-day P_{99} = 13 µg/L					

Sample Date	Chloride mg/L
01/01/2022	211
01/04/2022	226
01/07/2022	227
01/10/2022	231
Average	224

The following table presents the average concentrations and loadings at Outfall 001 from 07/01/2017 to 02/28/2022 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Averages of Parameters with Limits

	Average Measurement
BOD_5	4.83 mg/L*
TSS	3.79 mg/L*
pH field	7.92 s.u.
Phosphorus	2.71 mg/L
Ammonia Nitrogen	6.48 mg/L*
Fecal Coliform	42.9 #/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 P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Daily Maximum Limit Calculation Method

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. In accordance with s. NR 106.06(3)(b), limitations based on acute toxicity are either set equal to two times the acute criteria (the final acute value) or calculated using the mass balance equation below, whichever is more restrictive.

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

Where:

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

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

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

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

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

In this case, limits set equal to two times the acute criteria are more restrictive and this method is used to calculate the daily maximum limits shown in the table below.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 240.8 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340	680	136	<1		
Cadmium	273	32.6	65.2	13.0	<2		
Chromium	273	4104	8208	1642	<3		
Copper	273	40.0	80.0			20	17
Lead	273	282	564	113	<1		
Nickel	268	1080	2161	432	<8		
Zinc	273	290	579	116	18		
Chloride (mg/L)		757	1514	303	224		

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

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 75.25 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		152	2	28248	5650	<1	
Cadmium	175	3.82		718	144	<2	
Chromium	195	228	13	40497	8099	<3	
Copper	195	18.3	3	2886			13
Lead	195	53.4		10040.2	2008	<1	
Nickel	195	91.8		17269	3454	<8	
Zinc	195	216		40593	8119	18	
Chloride (mg/L)		395	12.8	71887	14377	224	

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

Monthly Average Limits based on Wildlife Criteria (WC)

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

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 107.3 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370		99057	19811	<2
Chromium (+3)	3818000	13	1022161324	204432265	<3
Lead	140		37481	7496	<1
Nickel	43000		11512071	2302414	<8

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 107.3 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	2	3027	605	<1

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent

limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for no toxic substances in this section.

Mercury – The permit application did not require monitoring for mercury because Princeton 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 Princeton is a lagoon system and has not removed sludge in the last five years. 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.**

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

The weekly and monthly average ammonia nitrogen limits could potentially increase with the increase in the receiving water low flows. However, to allow an increase in a limit above an existing limit the facility must demonstrate the need for the higher limits consistent with s. NR 207.04(1), Wis. Adm. Code. BOD_5 and TSS limits would not increase with an increased low flow because the current limits are the maximum limits publicly owned treatment works would be required to meet per s. NR 210.05 Wis. Adm. Code.

If Princeton would like to request an increase to the existing permit limits for ammonia nitrogen 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. If the facility can successfully demonstrate the need for increased effluent limitations required in ch. NR 207, Wis. Adm. Code, then a recalculation of the specific effluent limitation will be provided.

The current weekly and monthly average limits are 17 mg/L. An initial review suggests that the requirements of s. NR 207.04(1)(a), Wis. Adm. Code, do not appear to be met based ammonia nitrogen effluent concentrations based on data from 07/01/2017 to 02/28/2022. **Therefore, the current weekly and monthly average limits for ammonia mitrogen are required to be retained in the reissued permit consistent with s. NR 207.04(2), Wis. Adm. Code.**

Effluent Data
The table below summarizes effluent data from 07/01/2017 to 02/28/2022.

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
1-day P_{99}	27
4-day P_{99}	15

Attachment #1

30-day P_{99}	9.1
Mean*	6.5
Std	5.4
Sample size	213
Range	<0.1 – 20

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

Daily Maximum Ammonia Limits

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

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

Where:

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

The 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, WWFF & LFF

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

Section NR 106.33(2), Wis. Adm. Code, was 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, the table has been expanded from the table in the current permit to included ammonia nitrogen limits throughout the pH range.

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 Princeton'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
Princeton has monitored effluent *E. coli* from 05/04/2021 to 09/22/2021 and a total of 20 results are available. A geometric mean of 126 counts/100 mL was exceeded in 0 times during these 5 months, with a maximum monthly geometric mean of 93 counts/100 mL. Effluent data has exceeded 410 counts/100 mL 0 times. The maximum reported value was 259 counts/100 mL. Based on this effluent data **it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.**

PART 5 – PHOSPHORUS

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 Princeton does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance to s. NR 217.04(1)(a)1, Wis. Adm. Code, and therefore no technology-based limit is required.

Annual Average Mass Total Phosphorus Loading

Month	Monthly Avg. mg/L	Total Flow MG/month	Total Phosphorus lb./mo.
Jan 2021	3.0	4.8	120
Feb 2021	2.6	4.0	86.8
Mar 2021	3.4	5.3	149
April 2021	3.2	5.0	132
May 2021	3.5	4.7	139
June 2021	4.2	3.7	127
July 2021	3.8	5.6	178
Aug 2021	3.9	7.1	232
Sept 2021	3.8	4.1	132
Oct 2021	4.0	4.1	140
Nov 2021	3.9	3.9	127
Dec 2021	3.9	4.4	145

Average	142

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
Where total flow is the sum of the actual (not design) flow (in MGD) for that month

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

TMDL Limits – Phosphorus

Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*April 2020) and are based on the annual phosphorus wasteload allocation (WLA) given in pounds per year. This WLA found in Appendix 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:

$$\text{TP Equivalent Effluent Concentration} = \text{WLA} \div (365\ \text{days/yr} * \text{Flow Rate} * \text{Conversion Factor})$$
$$= 135\ \text{lbs/yr} \div (365\ \text{days/yr} * 0.26\ \text{MGD} * 8.34)$$
$$= 0.17\ \text{mg/L}$$

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

$$\text{TP 6-Month Average Permit Limit} = \text{WLA} \div 365\ \text{days/yr} * \text{multiplier}$$
$$= (135\ \text{lbs/yr} \div 365\ \text{days/yr}) * 1.30$$
$$= 0.48\ \text{lbs/day}$$

$$\text{TP Monthly Average Permit Limit} = \text{TP 6-Month Average Permit Limit} * 3$$
$$= 0.48\ \text{lbs/day} * 3$$
$$= 1.4\ \text{lbs/day}$$

The multiplier used in the six-month average calculation was determined according to the implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.6. This is the standard deviation divided by the mean of mass data. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as weekly; if a different monitoring frequency is used, the stated limits should be reevaluated.

Six-month average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to a concentration of 0.22 mg/L and 0.66 mg/L respectively at the facility design flow of 0.26 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 effluent total phosphorus monitoring data from 07/01/2017 to 02/28/2022.

Total Phosphorus Effluent Data

	Phosphorus mg/L	Phosphorus lbs/day
1-day P_{99}	5.5	14
4-day P_{99}	3.9	8.4
30-day P_{99}	3.1	5.7
Mean	2.7	4.5
Std	0.90	2.6
Sample size	214	214
Range	0.44 – 4.75	0.46 – 20

Multi-Discharge Variance Interim Limit
With the permit application, Princeton has applied for the phosphorus multi-discharger variance (MDV). Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. A review of effluent phosphorus data indicates that Princeton will be unable to comply with the 0.8 mg/L phosphorus limits required under s. 283.16 (6) (a) 1., Wis. Stats. Therefore, the recommended interim limit, pursuant to s. 283.16 (6) (am), Wis. Stats., is 1.0 mg/L as a monthly average. A compliance schedule may be appropriate to meet this interim limit but compliance with 1.0 mg/L shall be no later than the end of the reissued permit.

The effluent data indicates that 4-day P_{99} value of **3.9 mg/L is a level currently achievable (LCA)** for the discharge. A limit of 3.9 mg/L as a monthly average should not be exceeded during the compliance schedule.

PART 6 – TOTAL SUSPENDED SOLIDS

TMDL Limits
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 WLA for Princeton is 12,671 lbs/year or 34.7 lbs/day.

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

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

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

TSS Weekly Average Permit Limit = Daily WLA * Weekly multiplier
= 34.7 lbs/day * 3.11
= 108 lbs/day

TSS Monthly Average Permit Limit = Daily WLA * Monthly multiplier
= 34.7 lbs/day * 1.90
= 65.9 lbs/day

The multiplier used in the weekly average and monthly average calculation was determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 0.8. 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 3/week; if a different monitoring frequency is used, the stated limits should be reevaluated.

Weekly average and monthly average mass effluent limits are recommended for this discharge. The limits are equivalent to a concentration of 50 mg/L and 30 mg/L respectively at the facility design flow of 0.26 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 phosphorus monitoring data from 07/01/2017 to 02/28/2022.

TSS Effluent Data

	TSS mg/L	**TSS lbs/day**
1-day P_{99}	14	32
4-day P_{99}	8.8	18
30-day P_{99}	5.3	11
Mean	3.8	8.4
Std	2.7	6.4

Attachment #1

Sample size	222	173
Range	<2 – 17	0.85 – 38

Princeton can currently meet the calculated TMDL limits so these limits are recommended to become effective upon permit reissuance.

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 upstream flow available for dilution in the limit calculation (Qs:Qe >20:1), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code).

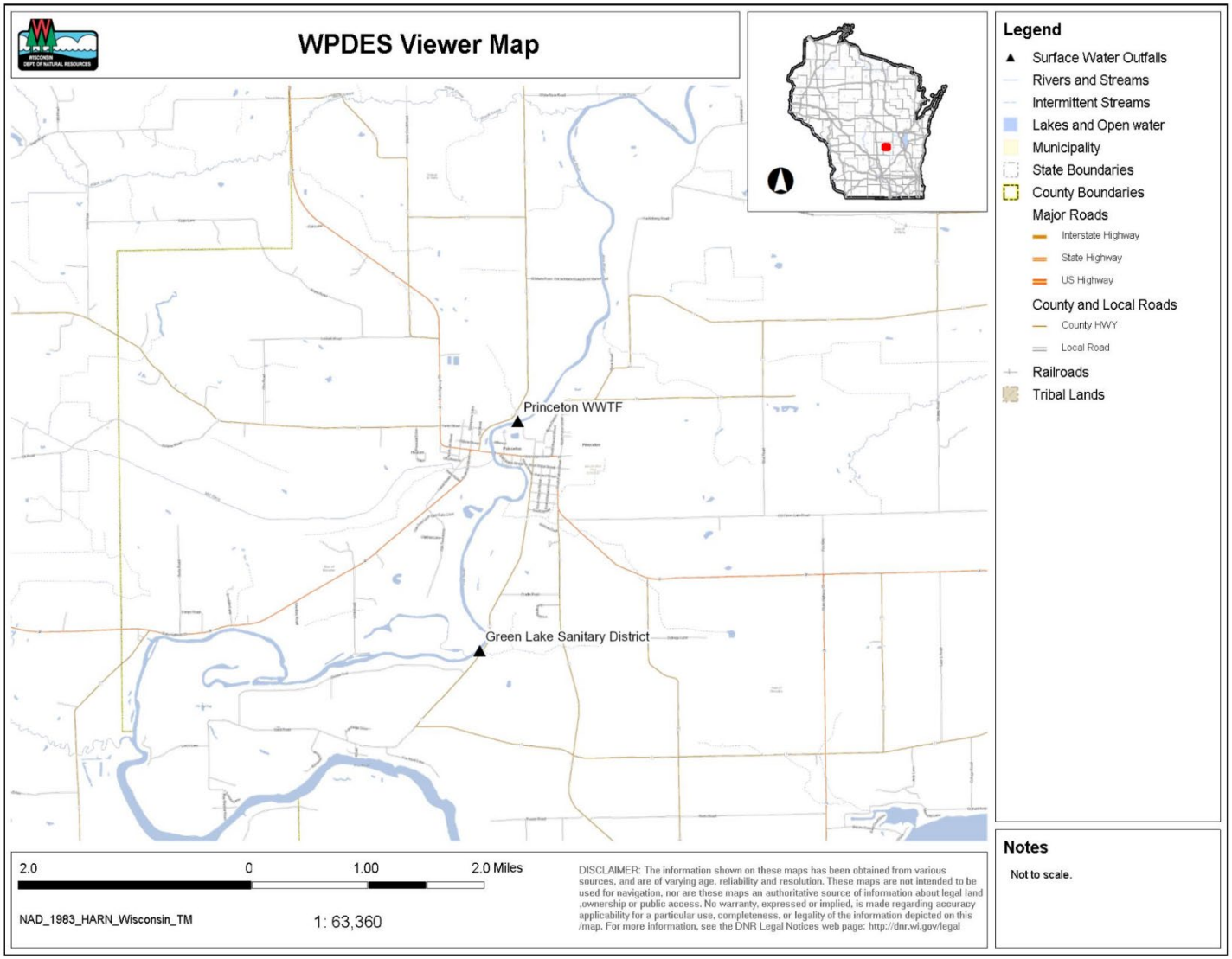
Because this is a lagoon treatment system of domestic waste with no industrial contributors, there is no reasonable potential for the discharge to exceed 120° F. **No monitoring is recommended in the reissued permit.**

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 (October 29, 2019).*

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

Attachment #2



Attachment #3

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Princeton		**7-Q_{10}:**	301.00	cfs		
Outfall(s):	001		**Dilution:**	25%		**Start:**	01/00/00	07/01/17
Date Prepared:	3/29/2022		**f:**	0		**End:**	01/00/00	02/28/22
Design Flow (Qe):	0.26	MGD	**Stream type:**	Small warm water sport or forage fish co			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	187.1	:1		
			Calculation Needed?	NO			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	301.00	0.291	0.407	0	-	-	NA	**120**
FEB	34	50	76	301.00	0.259	0.310	0	-	-	NA	**120**
MAR	38	52	77	301.00	0.828	0.924	0	-	-	NA	**120**
APR	48	55	79	301.00	0.394	0.528	0	-	-	NA	**120**
MAY	58	65	82	301.00	0.438	0.632	0	-	-	NA	**120**
JUN	66	76	84	301.00	0.316	0.506	0	-	-	NA	**120**
JUL	69	81	85	301.00	0.347	0.491	0	-	-	NA	**120**
AUG	67	81	84	301.00	0.508	0.716	0	-	-	NA	**120**
SEP	60	73	82	301.00	0.899	0.991	0	-	-	NA	**120**
OCT	50	61	80	301.00	0.624	0.701	0	-	-	NA	**120**
NOV	40	49	77	301.00	0.366	0.424	0	-	-	NA	**120**
DEC	35	49	76	301.00	0.276	0.400	0	-	-	NA	**120**

Mail Complete Application to:
Wisconsin Department of Natural Resources
Permits Section-WQ/3
PO Box 7921
Madison, WI 53707-7921

Phosphorus Multi-Discharger Variance Application for Municipal Facilities - s. 283.16, Wis. Stats.

Form 3200-150 (R 01/22)

Notice: Pursuant to s. 283.16, Wis. Stats, an owner of an existing permitted wastewater treatment system may apply for a variance to a phosphorus water quality based effluent limits (WQBEL). Complete this form and submit to the Department of Natural Resources (DNR) to request coverage under the multi-discharger variance (MDV) for phosphorus. Personal information collected will be used for administrative purposes and may be provided to requestors to the extent required by Wisconsin's Public Records law [ss. 19.31-19.39, Wis. Stats.]

Facility and Permit Information

WPDES Permit No. WI- 0 | 0 | 2 | 2 | 0 | 5 | 5			
Facility Name Princeton Wastewater Treatment Facility			
Facility Street Address 438 W. Main St.			
City Princeton	State WI	ZIP Code 54968	
Receiving Water Fox River	County Green Lake		
Source of Water Supply Princeton Waterworks	Average Discharge Flow Rate 0.150 mgd		

Facility Contact Information

Contact Name Ernest Schmidt			
Title Operator			
Address 438 W. Main St.			
City Princeton	State WI	ZIP Code 54968	
Phone No. (incl. area code) (920) 299-6038	Fax Number		
Email Address cityofprinceton@centurytel.net			

Variance Request Schedule

Check all that apply:

1. This variance is being requested at the time of application for permit reissuance pursuant to s. 283.16(4)(b)1, Wis. Stat. ☒

2. This variance is being requested within 60 days after the department reissues or modifies the permit to include a phosphorus WQBEL pursuant to s. 283.16(4)(b)2, Wis. Stat. ☐

3. This variance is being requested from a current WPDES Permit pursuant to 283.16(4)(b)3, Wis. Stat ☐

   Date of Current Permit Issuance: _____

   Note: WPDES permit must be issued prior to April 2014.

4. Has the MDV been included in previously issued WPDES Permits?

   Yes ◯

   How many permits has the MDV been approved for? _____

   No ◉

Variance Requirements

5. Has this point source discharge been authorized by a WPDES permit prior to December 1, 2010? ◉ Yes ◯ No

   Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat. STOP

6. Has this point source relocated its outfall location since December 1, 2010? ◯ Yes ◉ No

7. Is the point source located in an eligible MDV county as specified in Appendix H of the MDV Implementation Guidance? ◉ Yes ◯ No

   Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat.

8. Does this limit require a major facility upgrade in order to achieve compliance? ◉ Yes ○ No

Justify:
The current wastewater treatment facility cannot comply with the TMDL phosphorus limit and would require a complete upgrade. The existing facility currently produces effluent with a much greater phosphorus concentration than the final permitted limit. For more information, see the 2023 Final Phosphorus Compliance Alternatives Plan.

Note: If no, you are ineligible for the MDV in accordance with s. 283.16(4), Wis. Stat. STOP. A major facility upgrade means that a facility needs to install new equipment and a new process such as installing filtration or equivalent technology.

9. Phosphorus Water Quality-Based Effluent Limitation from which variance is sought:

◉ Concentration-based WQBEL pursuant to s. NR 217.13, Wis. Adm. Code
○ TMDL mass-based WQBEL pursuant to s. NR 217.16, Wis. Adm. Code

Check all months for which variance is requested:

◉ All

☒ Jan	☒ Apr	☒ Jul	☒ Oct
☒ Feb	☒ May	☒ Aug	☒ Nov
☒ Mar	☒ Jun	☒ Sep	☒ Dec

10. Do you believe these limits could be achieved during the term of the permit? ○ Yes ◉ No

11. Current effluent quality

Note: Use 30-day P99 if 11 or more representative effluent samples are present. Only include effluent data for those outfall(s) a variance is being requested for.

Outfall Number(s)	Conc. (mg/L)	Number of Samples Results Used	Sample Time Period Used	
1	3.67	195	01/01/2019	03/28/2023

12. Are applicable phosphorus limits currently effective in the WPDES permit more restrictive than 1 mg/L? ○ Yes ◉ No

Facility Information (provide attachments as necessary)

13. What are the average phosphorus levels within your influent TP concentration? 6.88 mg/L

14. Has the treatment process at the facility been optimized to maximize its phosphorus removal capabilities?

○ Yes

Completion date: _____

◉ No, but in process of completing

○ No, not yet started

15. Has a facility planning or evaluation study for phosphorus been approved by the Department?

- ○ Yes

  Approval date: _____

- ◉ No, but in process of completing
- ○ No, not yet started

16. Briefly describe the technology that would need to be added to comply with phosphorus limits in your permit:
The facility would be required to use tertiary filtration with chemical to meet the effluent requirements. This technology includes disc filters, backwash pumps, chemical mixing tanks, chemical storage tanks, chemical feed pumps, automated cleaning systems, and the associated instrumentation and controls.

Attach any new or additional information that you would like to provide the Department regarding optimization measures and/or compliance alternatives planning efforts.

Projected Compliance Costs

17. What is the projected net present value cost for complying with the phosphorus WQBELs? $4,900,000

Source of cost projection:
The cost of the phosphorus compliance using tertiary treatment was evaluated in the 2023 Final Phosphorus Compliance Alternatives Plan. The anticipated 20-year present worth cost of compliance was $4.9 million. This figure includes the initial capital cost, annual replacement fund, annual operations and maintenance, and the salvage value at the end of the 20-year period.

Note: If a facility uses projected compliances costs provided in the Economic Impacts Analysis, they must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.

18. Has the feasibility of water quality trading or adaptive management been evaluated for the facility?

- ◉ Yes
- ○ No

19. Is the facility eligible for adaptive management or water quality trading?

- ◉ Yes
- ○ No

20. What is the needed offset to comply with AM/WQT?

_____ lbs/year

- ☒ Unknown at this time

21. Is adaptive management or water quality trading a viable compliance option?

- ○ Yes
- ◉ No

Describe:
Refer to Chapter 6.5 of the 2023 Final Phosphorus Compliance Alternatives Plan.

Service Area Information- Provide the following information for each municipality included in the wastewater facility service area.

Municipality Name	County	Population Served	Customer Households Served	Median Household Income (MHI)
City of Princeton	Green Lake	1,267	588	$53,083.00

Non-Residential Customers:

Percent of wastewater flow attributed to commercial industrial, large institutional and any other special customer category: 18 %

Describe types of non-domestic wastewater contributions that constitute a significant phosphorus contribution or that significantly affect the capabilities of the treatment facility. Examples include: large food processors, dairies, or industries with unique wastewater.

There are two industrial users that contribute low quantities of domestic strength wastewater. No commercial or industrial users within the service area are believed to be significant phosphorus contributors.

The percent of flow attributed to commercial, industrial, large institutional, and special customer categories was calculated as the percentage of all water sold to non-residential users. This information was collected from the Princeton Municipal Water and Electric Utility's Water, Electric, or Joint Utility Annual Report for 2022.

Affordability to Municipal Dischargers

22. What is the projected household user charge, expressed as a percent of MHI, once phosphorus compliance costs are factored in? 1.263 %

Attach supporting information on a separate attachment to this form. The applicant may also provide additional information on impacts to commercial, industrial, or other special customers or any other information regarding affordability.

23. What is the secondary indicator score for the county (counties) in which the service area is located in? 5

Note: See Appendix A of the MDV Implementation Guidance for details.
If the service area is located in multiple counties, provide the weighted average value.

Watershed Project. Select one of the following watershed project options:

Option A. County payment contribution ◉

Option B. Binding, written agreement with the DNR to construct a project or implement a watershed plan. ○

Submit Form 3200-148 with MDV application

Option C. Binding, written agreement with another entity that is approved by the DNR to construct a project or implement a watershed plan. ○

Submit Form 3200-148 with MDV application.

Certification

Based on the information provided, I believe that my permitted facility qualifies for coverage under the multi-discharger phosphorus variance based on the requirements of s. Wis. Stat. 283.16 (4), Wis. Stat. I understand that as a condition of the variance, the Department will impose interim limitations and require a watershed project or plan to be completed as part of the phosphorus reduction measures for phosphorus during the term of the variance in accordance with s. Wis. Stat. 283.16(6). I understand that these conditions will be included in the WPDES permit issued to this facility and I agree to comply with all applicable permit conditions for this variance. I hereby certify that the determination in Wis. Stat. 283.16(2)(a) applies to my permitted facility and that my permitted facility cannot otherwise comply with its phosphorus water quality based effluent limitations without a major facility upgrade. To the best of my knowledge, the information in this application is true, accurate, and complete.

Print or type name of person submitting request (Individual must be an Authorized Representative)	Title
Mary Lou Neubauer	City Administrator
Signature of Official	Date Signed
Mary Lou Neubauer	7/12/2023

Submit to Coordinator... | Save | Print... | To Catalog

State of Wisconsin
Department of Natural Resources
Bureau of Water Quality
Permits Section - WQ/3

Multi-Discharger Variance Application Evaluation Checklist

Form 3200-145 (R 5/16)

Notice: This checklist is meant to be a tool to help Department of Natural Resources (DNR) staff review municipal and industrial multi-discharger variance (MDV) applications (Forms 3200-149 and 3200-150). Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31-19.39, Wis. Stats.).

Permittee Name: City of Princeton

WPDES Permit Number: WI- 0 0 2 2 0 5 5

County: Green Lake

1.	Did the point source apply for the MDV at the appropriate time?	(●) Yes ( ) No. *STOP- facility not eligible at this time.*	*See Questions 1-3.*
2.	This operation is (check one):	( ) New or relocated outfall. *STOP- facility not eligible.* (●) Existing outfall	*See Questions 5-6.*
3.	Is the point source is located in an MDV eligible area?	(●) Yes ( ) No. *STOP- facility not eligible.*	*Apply County information to Appendix H. Additional information provided in Q7 on municipal form & Q7-8 on industrial form.*
4.	The secondary indicator score for the county (counties) the discharge is located is:	5	*See Appendices A-F. If the score is less than 2, stop; the facility is not eligible. See Q23 on municipal form & Q28 on industrial form.*
5.	Is a major facility upgrade required to comply with phosphorus limits?	(●) Yes ( ) No. *STOP- facility not eligible.*	*See Q8 on municipal form/Q9 on industrial form.*
6.	List the months where phosphorus limits cannot be achieved during the permit term:	☒ All ☒ Jan ☒ Apr ☒ Jul ☒ Oct ☒ Feb ☒ May ☒ Aug ☒ Nov ☒ Mar ☒ Jun ☒ Sep ☒ Dec	*Consider checking with limit calculator. If this does not match information in application, the application should be updated prior to approval.*

7. What is the current effluent level achievable?

Outfall Number(s)	Conc. (mg/L)	Method for calculation:	Does this concur with application?	
001	4.03	(●) 30-day P99 ( ) Other, specify:	( ) Yes (●) No, why not:	application used older data

DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.

8. What is the appropriate interim limitation(s) for the permit term?

1.0 mg/L as a monthly average, pursuant to s. 283.16(6)(am), Wis. Stats.
Target Value = 0.2 mg/L
Facility upgrades will be required in the coming permit term to comply with the interim limit

Provide Rationale:

Effluent total phosphorus data from the past three years (7/1/2020 - 6/30/2023, n=139) yields a 30-day P99 value of 4.03 mg/L. This value represents a level currently achievable. A schedule is likely needed in the reissued permit for installation of treatment to achieve 1.0 mg/L. If the MDV is applied for in future permit terms, the interim limit will be lowered in accordance with s. 283.16(6) and highest attainable condition requirements.

Note: See description in Section 2.02 of the MDV implementation guidance. Interim limitations should reflect the "highest attainable condition" for the permittee in question pursuant to s. 283.16(7), Wis. Stat.

Save

9. *For Industries Only*- Where does the phosphorus in the effluent come from? (check all that apply)	☐ Process ☐ Additive Usage ☐ Water supply *Can intake credits be given or can the facility use an alternative water supply?* ◯ Not feasible ◯ Possibly, but further analysis needed ◯ Not evaluated at this time	*See Q14-15 & 19 on industrial form. If the answer is "possibly" or "not evaluated", the schedule section of the MDV permit should contain a requirement to perform this analysis.*
10. Has this facility optimized?	◯ Yes ◉ In progress ◯ No	*See Q14 on municipal form & Q16 & 20 on industrial form. Facility must optimize and operate at an optimize treatment level (s. 283.16(6)(a), Wis. Stat.)If no will need compliance schedule.*
11. Has a facility plan/compliance alternative plan been completed for the facility?	◉ Yes ◯ In progress ◯ No	*See Q15 on municipal form & Q17 on industrial form.*
12. What is the projected cost for complying with phosphorus? Source:	$ 4,900,000.00 20-year net present worth from Final Compliance Alternatives Plan	*Facility must submit site-specific compliance costs. If cost projections are used from EIA, the permittee must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.*

Comments on planning efforts:

The City of Princeton undertook phosphorus-related planning efforts during the prior permit term. Initially, biological augmentation -"magic bugs"- were evaluated, but this approach was deemed ineffective. A Final Compliance Alternatives Plan, dated May 2023 was authored by MSA professional services and submitted on behalf of the City. The Plan evaluates construction-based and watershed-based alternatives for compliance with the final limit. All are deemed infeasible except water quality trading, which may be feasible for the next permit term. The City should investigate trading opportunities in the coming permit term. The lowest cost tertiary filtration option - disc filtration - is provided a site-specific cost estimate and used in the economic demonstration below.

13. Are adaptive management and water quality trading viable?	◯ Yes ◉ Perhaps. Additional analysis required. ◯ No	*See Q18-21 on municipal form & Q22-25 on industrial form. If additional analyses required, the applicant may need to complete this analysis during the MDV permit term.*
14. Has the point source met the appropriate primary screener?	◉ Yes ◯ No. *STOP- facility not eligible.*	*See Q4 of this form in addition to the "eligibility" guidance in Section 2.01 of the MDV Implementation Guidance.*

Comments on economic demonstration:

The Final Compliance Alternatives Plan recommends disc filtration to achieve final phosphorus effluent limits at a cost of $3,500,000 (capital) and $100,000 (annual O&M increase). These values are consistent with the DOA economic impact assessment analysis values of $3.5M (capital) and $177,000 (O&M). Capital costs, financed with a 20-year CWF low interest loan result in annual payments of $215,267. Annual costs come to 315,267 with additional O&M. The residential portion (82%) is $258,518.94. This cost, divided amongst 588 customer households results in annual average per user rate increase of $439.66. Current rates are $410.74 as an annual average for city residents. Future sewer rates would be $850.40 annually. This value is 1.6% of the City's $53,083 median household income. In Green Lake County with a secondary indicator score of 5, sewer rates at 1% of MHI meet the primary screener. The applicant meets the primary screener.

Save

15. What watershed option was selected?

- (●) County project option. *Complete Section 5.*
- ( ) Binding, written agreement with the DNR to construct a project or implement a watershed plan. *Complete Section 4.*
- ( ) Binding, written agreement with another person that is approved by the DNR to construct a project or implement a watershed plan. *Complete Section 4.*

Section 4. Watershed Plan Review

16. MDV Plan Number:
Note: This is for tracking purposes. Contact Statewide Phosphorus Implementation Coordinator for the plan number.

17. Did the point source complete Form 3200-148?
- ( ) Yes
- ( ) No

18. Is the project area in the same HUC 8 watershed as the point of discharge?
- ( ) Yes
- ( ) No. *STOP- Watershed plan must be updated.*

19. What is the annual offset required?
See Section 2.03 of the MDV implementation guidance. If this value is different from the offset target provided in form 3200-148, the watershed plan should be amended.

20. Does the plan ensure that the annual load is offset annually?
- ( ) Yes
- ( ) No. *STOP- Watershed plan must be updated.*

21. Are projects occurring on land owned/operated by a CAFO or within a permitted MS4 boundary?
- ( ) Yes. *Work with appropriate DNR staff to ensure projects are not working towards other permit compliance.*
- ( ) No.

22. Are other funding sources being used as part of the MDV watershed project?
- ( ) Yes. *Work with appropriate DNR staff to ensure that funding sources can be appropriately used in the plan area.*
- ( ) No.

23. Do you have any concerns about the watershed project?
Note: Coordinate with other DNR staff as appropriate.
- ( ) Yes. *STOP- Watershed plan must be updated.*
- ( ) No.

Comments:

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is: $ 62.65

See "Payment Calculator" document at
\\central\water\WQWT_PROJECTS\WY_CW_Phosphorus\MDV.

Section 6. Determination

Based on the available information, the MDV application is:
- (●) Approved
- ( ) Request for more information
- ( ) Denied

Save

Multi-Discharger Variance Application Evaluation Checklist

Additional Justification (if needed):

Note the variance will apply to TMDL-based limits, not concentration limits as specified in response to MDV application question #9.

Certification

Preparer Name	Title	
Matt Claucherty	Water Resources Management Specialist	
Signature of Preparer Sign Clear		Date 8/21/2023

A copy of this completed checklist should be saved in SWAMP, and a notification of the decision should be sent to the Phosphorus Implementation Coordinator.

Submit to Coordinator...

Save

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Tony Evers, Governor
Adam N. Payne, Secretary
Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711

8/21/2023

Mary Neubauer, City Administrator
P.O. Box 53
Princeton, WI 54968

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Upper Fox River in Green Lake County
Permittee: City of Princeton, WPDES WI-0022055

Dear Ms. Neubauer:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for the City of Princeton in an application dated 7/12/2023. Wisconsin's multi-discharger phosphorus variance was approved by EPA on February 6, 2017. Coverage under the multi-discharger phosphorus variance may only be granted to an existing source that demonstrates a major facility upgrade is necessary to achieve phosphorus compliance and the upgrade will result in economic hardship as defined in the federally approved variance. The water quality criterion for which you are seeking a variance is contained in s. NR 102.06, Wis. Adm. Code.

After review of the application materials, the Department is tentatively approving coverage under the phosphorus multi discharger variance because the applicant has demonstrated that a major facility upgrade would be required to comply with the phosphorus water quality based effluent limitation, and the applicant meets the economic hardship eligibility criteria delineated in the federally approved variance. In addition, the permitted facility has agreed to comply with the interim limitations that will be included in the WPDES permit, and has agreed to reduce the amount of phosphorus entering surface waters by making payments to the counties pursuant to s. 283.16(6)(b)1., Wis. Stats.

Public comment on this decision will be solicited at the time of permit reissuance after which a final decision will be made. The Department appreciates your attention and interest in Wisconsin's multi-discharger phosphorus variance. Should you have further questions regarding this matter, please contact me at (608) 400 – 5596 or by email at matthew.claucherty@wisconsin.gov.

Sincerely,

Matt Claucherty, MDV Point Source Coordinator
Bureau of Water Quality

e-cc Ernie Schmidt, City of Princeton
Laurel Last, WDNR
Barti Oumarou, WDNR
Sarah Adkins, WDNR
Tim Elkins, EPA Region 5
Micah Bennett, EPA Region 5