Permit Fact Sheet

General Information

Permit Number	WI-0021105-11-0
Permittee Name and Address	VILLAGE OF BLANCHARDVILLE 208 Mason Street P.O. Box 9, Blanchardville, WI 53516
Permitted Facility Name and Address	Blanchardville Wastewater Treatment Facility 610 EAST SCHOOL STREET, BLANCHARDVILLE, WISCONSIN
Permit Term	July 01, 2026 to June 30, 2031
Discharge Location	West bank of the East Branch Pecatonica River, approximately 170 feet from effluent sampling location.
Receiving Water	East Branch of the Pecatonica River in Lower East Branch Pecatonica Rivers Watershed of Sugar - Pecatonica River Basin in Lafayette County
Stream Flow ($Q_{7,10}$)	48 cfs
Stream Classification	Warm water sport fish (WWSF), non-public water supply
Discharge Type	Existing Continuous
Annual Average Design Flow (MGD)	0.099 MGD
Industrial or Commercial Contributors	None
Plant Classification	Basic with subclasses A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; SS - Sanitary Sewage Collection System. One certified operator.
Approved Pretreatment Program?	N/A

Facility Description

The Village of Blanchardville operates an extended aeration activated sludge wastewater treatment facility that consists of a manual bar screen, oxidation ditch, final clarification, chemical phosphorus removal, and ultraviolet disinfection. Biosolids are stored in an aerated liquid sludge storage tank and then pumped to a larger unaerated sludge storage tank where it is held until land applied on approved farm fields. Upgrades were completed during the previous permit term, between 2024-2025, and included the new chemical feed system and storage building, new SCADA system, and removal of the trickling filter and grit chamber. Replacement upgrades also occurred for much of the remaining system.

Substantial Compliance Determination

Enforcement During Last Permit: Primary enforcement actions occurred for violations of the effluent limitations. The facility has completed all previously required actions as part of the enforcement process.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on **March 26, 2026**, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Caitlin O'Connell on April 14, 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	0.04 MGD (Oct. 2020 - Sept. 2025)	Influent: 24-hour flow proportional composite sampler intake located in the influent wet well in the headworks building. Flow meter located in the headworks building upstream of the influent wet well.
001	N/A – Effluent flow not measured	Effluent: 24-hour time proportional composite sampler intake located in the effluent channel prior to UV disinfection. Grab samples collected after UV disinfection, prior to discharge to the East Branch of the Pecatonica River.
002	6 Dry US Tons (2025 Permit Application)	Liquid, Class B. Representative sludge samples shall be collected from the sludge holding tank.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	2/Week	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit:

None.

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**
BOD5, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Comp	
BOD5, Total	Monthly Avg	30 mg/L	2/Week	24-Hr Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	2/Week	24-Hr Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	2/Week	24-Hr Comp	
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total		mg/L	2/Month	24-Hr Comp	Monitoring only in 2029.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit effective May through September.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit effective May through September. See the "E. Coli Percent Limit" section. Enter the result in DMR on the last day of the month.
Chloride		mg/L	Monthly	24-Hr Comp	Monitoring only in 2029.
Phosphorus, Total	Monthly Avg	0.6 mg/L	2/Week	24-Hr Comp	This is an interim MDV limit. See the MDV/phosphorus sections 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.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum total of the total monthly discharges (for the months that MDV is in effect) for the calendar year on the annual report form.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

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. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

Sample Type – Sample type changed to 24-Hr Comp to reflect the current sampling procedure.

pH – Sample frequency increased to 5/week.

Phosphorus MDV- The permittee has applied for a multi-discharger variance (MDV) for phosphorus for this permit term and the application has been approved by the Department. An MDV interim limit of 0.6 mg/L has been added that goes into effect at reissuance. The permittee is required to report the total amount of phosphorus discharged in lb/month and lbs/year. By March 1 of each year, the permittee shall make a payment(s) to participating county(s) of $68.40 per pound of phosphorus discharged during the previous year in excess of the target value of 0.2 mg/L.

E. coli- Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.

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 April 30, 2026.

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure

consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.

- pH sampling and monitoring frequency set to 5/week. Guidance recommends pH sampling frequency of 7/week. However, this is a small facility which lacks industrial dischargers, so sampling reduction to 5/week is warranted.
- Ammonia monitoring frequency set to 2/month in 2029. Guidance recommends ammonia monitoring at 3/week. However, the facility is at low risk for reaching acute toxicity criteria and monitoring data is only needed to establish reasonable potential for the following permit term.

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	Aerobic SOUR Test -OR- Injection	Land Application	6
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? **No**, design flow is less than 5 MGD.						

3.1 Sample Point Number: 002- SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2029.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2029.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

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. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

PCB – Monitoring year updated.

PFAS – Monitoring is required annually 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) 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.

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 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: (lbs of phosphorus discharged minus the permittee's target value) times ($68.40 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.	03/01/2027
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2028
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2029
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2030

Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2031
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.	

4.1.1 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 nonpoint 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 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 $68.40 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).

4.2 Phosphorus Schedule - Optimization and Compliance Planning

The permittee is required to optimize performance and undertake compliance planning to control phosphorus discharges per the following schedule.

Required Action	Due Date
Optimization and Compliance Alternatives: The permittee shall implement a phosphorus discharge optimization plan to control phosphorus discharges to the greatest extent practicable. Submit a progress report that summarizes the approach to phosphorus removal at the facility, the resulting concentration and mass loading for the last 12-month period, and any changes that were or are needed to optimize removal of phosphorus by the due date. The permittee shall also evaluate alternative phosphorus compliance options such as water quality trading and adaptive management. The progress report submitted on the date due shall also detail any outreach activities undertaken to evaluate these options, any communications with credit generators, brokers/clearinghouse, and any potential water quality trading or adaptive management projects that may lead to compliance with phosphorus WQBELs. Financial alternatives evaluation: If the permittee intends to seek a renewed variance at the end of this permit term, the permittee may complete a financial evaluation to support ongoing variance eligibility. The report must evaluate financial mechanisms that have the potential to make compliance with phosphorus WQBELs economically feasible. Include an assessment of the feasibility and financial outcomes of the following opportunities: variable rate structures, grants through USDA or other sources, and DNR's Clean Water Fund Program. The assessment of the DNR's Clean Water Fund program should take into account subsidized interest rate loans, principal forgiveness, and other options as outlined in EPA's March 2024 Financial Capabilities Assessment Guidance, Appendix C.	06/30/2027
Progress Report #2: Submit a progress report per the above for the prior calendar year.	06/30/2028

Progress Report #3: Submit a progress report per the above for the prior calendar year.	06/30/2029
Progress Report #4: Submit a progress report per the above for the prior calendar year.	06/30/2030
Final MDV Optimization and Compliance Alternatives Report: Submit a progress report per the above for the prior calendar year. If water quality trading or adaptive management will be used to comply with phosphorus limitations during the next permit term, submit a draft water quality trading plan, adaptive management plan, or executed clearinghouse credit purchase agreement. The financial alternatives evaluation as described above must be submitted by the date due if the facility chooses to seek renewal of the variance.	12/31/2030

4.2.1 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 applicable effluent limits. This compliance schedule requires the permittee to prepare an optimization plan with a schedule for implementation and submit it for Department approval. The schedule also includes a compliance planning element focused on economically feasible solutions to low-level phosphorus effluent limits such as water quality trading or adaptive management. The permittee shall take the steps called for in the optimization plan and submit annual progress reports on optimizing the removal of phosphorus and establishing a water quality trade or adaptive management project. Should the permittee intend to reapply for a subsequent term of variance coverage, a financial alternatives analysis will need to be completed. Report elements are listed in the schedule, and more information can be found in EPA's March 2024 Financial Capabilities Assessment Guidance, Appendix C.

4.3 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan Submittal: Submit an update to the management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.	06/30/2027

4.3.1 Explanation of Schedule

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

Other Comments

None

Attachments

Water Quality Based Effluent Limits Memo dated April 30, 2026

MDV Approval Letter dated October 14, 2025

MDV Checklist dated October 14, 2025

Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance.

Prepared By: Chris Holland - Wastewater Engineer

Date: April 30, 2026

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: April 30, 2026

TO: Betsyjo Howe – SCR/Fitchburg

FROM: Zainah Masri – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Blanchardville Wastewater Treatment Facility
WPDES Permit No. WI-0021105-11-0

Updated from December 15, 2025 WQBEL memo; Change design flow rates, toxics tables and phosphorus mass limits.

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 Blanchardville Wastewater Treatment Facility in Lafayette County. This municipal wastewater treatment facility (WWTF) discharges to the East Branch of the Pecatonica River located in the Lower East Branch of the Pecatonica River Watershed (SP03) in the Sugar-Pecatonica River Basin. 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	30 mg/L		1
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen						1,2
Bacteria						1,3
E. coli				126 #/100 mL geometric mean		
Chloride						1,4
Phosphorus LCA Interim Limit HAC Interim Limit				 1.0 mg/L 0.6 mg/L		5
Final WQBEL Mass Limit				0.225 mg/L	0.075 mg/L 0.062 lbs/day	
TKN, Nitrate+Nitrite, and Total Nitrogen						6
Acute WET						7,8,9

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. 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.
4. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.

5. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 1.0 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 0.6 mg/L can be met. The final WQBELs remain at 0.225 mg/L as a monthly average and 0.075 mg/L as a six-month average, as well as a respective mass limit.
6. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).
7. After consideration of the guidance provided in in the Department's *WET Program Guidance Document* (2022) and other information described, 3 acute WET tests are recommended throughout the permit term. 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.
8. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge.
9. <u>If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute WET testing is not required.</u>

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

Attachments (3) – Narrative, Site Map & Ammonia Nitrogen Calculations

PREPARED BY: Zainah Masri, Water Resources Engineer Zainah Masri

APPROVED BY: Diane Figiel Date 04/30/2026
Diane Figiel, PE,
Water Resources Engineer

E-cc: Caitlin O'Connell, Wastewater Engineer – SCR/Dodgeville
Lisa Creegan, Regional Wastewater Supervisor – SCR/Fitchburg
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Environmental Engineering Manager – WY/3
Kari Fleming, Natural Resources Program Manager – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Blanchardville Wastewater Treatment Facility

WPDES Permit No. WI-0021105-11-0

Prepared by: Zainah Masri – WY/3

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Blanchardville operates a wastewater treatment facility designed to treat 0.132 million gallons per day (MGD). The plant serves a population of approximately 820 with some commercial businesses and no significant industrial contributors. Treatment consists of grit removal, activated sludge (oxidation ditch), final clarification, and ultraviolet disinfection. Biosolids are stored in an aerated liquid sludge storage tank and then pumped to a larger unaerated sludge storage tank where it is held until land applied on approved farm fields.

Aluminum sulfate was added for chemical phosphorus removal in 2024 and a new effluent flow meter was installed in January 2025.

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

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD_5			45 mg/L	30 mg/L		1,4
TSS			45 mg/L	30 mg/L		1,4
pH	9.0 s.u.	6.0 s.u.				1,4
Ammonia Nitrogen						3
Chloride						3
Bacteria						
Interim Limit Fecal Coliform				400 #/100 mL geometric mean		5
Final Limit *E. coli*				126 #/100 mL geometric mean		
Phosphorus LAC Limit HAC Limit				4.4 mg/L 1.0 mg/L		6
Final Mass Limit				0.225 mg/L	0.075 mg/L 0.083 lbs/day	

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
TKN, Nitrate+Nitrite, and Total Nitrogen						7

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. Monitoring only.
3. Monitoring only from January 01, 2024 to December 31, 2024.
4. These limits are based on the Warm Water Sport Fish (WWSF) of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
5. A compliance schedule is in the current permit to meet the final *E.coli* limit by April 30, 2022.
6. A compliance schedule is in the current permit to meet the phosphors MDV interim limit by April 1, 2024.
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. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).

Receiving Water Information

- Name: East Branch of Pecatonica River
- Waterbody Identification Code (WBIC): 897800
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply and recreational use.
- 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 the USGS Station located at Highway 78, 1.8 miles south of Blanchardville.
  7-Q_{10} = 48 cubic feet per second (cfs)
  7-Q_2 = 67 cfs
  90-Q_{10} = 57 cfs
  Harmonic Mean = 123 cfs
- Hardness = 383 mg/L as CaCO3. This value represents the geometric mean of data from four sites in the Pecatonica River Basin collected between 1998 and 2015.
- % of low flow used to calculate limits in accordance with s. NR 106.06 (4) (c) 5., Wis. Adm. Code: 25%
- Source of metal background concentration data from station #10031442 (East Branch Pecatonica River 150 ft. N. of Pine St. and Railroad St. (at boat launch)) were used in this evaluation. All sample results from September 27, 2010 for the toxic substances are below the level of detection. Therefore, the background concentration is assumed to be negligible and a value of zero is used in the computations.
- Multiple dischargers: There are several other dischargers to the East Branch of Pecatonica River, but 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 East Branch of Pecatonica River (miles 55.02 to 59.81) is listed as

impaired for total phosphorus at the point of discharge.

Effluent Information

- New Design flow rate:
  Annual average = 0.099 million gallons per day (MGD)
  Maximum Monthly = 0.177 MGD
  Maximum Daily = 0.466 MGD
- *Previous Design flow rate:*
  Annual average = 0.132 MGD

Design flow and loadings updated as part of S-2022-0802 approval. For reference, the actual average flow from October 2020 to September 2025 was 0.04 MGD. Please note that the facility is monitoring the flow rate from the influent outfall 701.

- Hardness = 329 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected from April 2025 to May 2025 which were reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water supply: Municipality waterworks and private wells.
- Additives: Blanchardville Wastewater Treatment Facility has included additives in the permit application that have the potential to be present in Outfall 001. These additives are listed below:
  - Aluminum Sulfate – Phosphorus Removal
  - An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. This is the case upon initial review of the listed additive, and the facility is not requesting increased dosages or use frequencies. Therefore, an additive review is not needed at this time.
- 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, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Copper Effluent Data

Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)	Sample Date	Copper (µg/L)
04/12/2025	5.8	04/24/2025	<5.2	05/06/2025	<5.2
04/15/2025	<5.2	04/27/2025	<5.2	05/09/2025	5.5
04/18/2025	5.6	04/30/2025	<5.2	05/12/2025	<5.2
04/21/2025	<5.2	05/03/2025	6.3		
Mean = 2.1 µg/L					

"<" means that the pollutant was not detected at the indicated limit of detection. The mean concentration was calculated using zero in place of the non-detected results.

Chloride Effluent Data

Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)
01/16/2024	331	05/07/2024	190	09/09/2024	164
02/13/2024	277	06/11/2024	151	10/22/2024	209

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Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)
03/13/2024	246	07/15/2024	179	11/13/2024	201
04/10/2024	172	08/13/2024	189	12/10/2024	287
1-day P_{99} = 380 mg/L					
4-day P_{99}= 290 mg/L					

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

Parameters with Effluent Limits

	Average Measurement
BOD_5	4.5 mg/L*
TSS	4.6 mg/L
pH field	7.4 s.u.
Fecal Coliform	3.7 #/100 mL**
E. coli	6.1 #/100 mL**
Phosphorus	3.2 mg/L

*Results below the limit of detection (LOD) were included as zeroes in calculation of average.
** The average measurement for bacteria is calculated as a geometric mean. Values reported below the LOD are replaced with a value of 1 for the calculation of the geometric mean.

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

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

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

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for the Blanchardville Wastewater Treatment Facility and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling for all the detected substances. 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 = 38 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	<7.7		
Cadmium	329	40	81	16	<0.41		
Chromium	301	4,446	8,892	1,778	<1.1		
Copper	329	48	96	19	2.1		
Lead	329	338	676	136	<1.4		
Nickel	268	1,080	2,161	432	<1.5		
Zinc	329	341	682	136	31		
Chloride (mg/L)		757	1,514			380	331

* 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 = 12 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	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		152	12,075	2,415	<7.7	
Cadmium	175	3.8	303	60	<0.41	

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SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chromium	301	326	25,845	5,169	<1.1	
Copper	303	33	2,591	518	2.1	
Lead	356	96	7,578	1,516	<1.4	
Nickel	268	120	9,535	1,907	<1.5	
Zinc	333	345	27,347	5,469	31	
Chloride (mg/L)		395	31,339			290

* 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 = 31 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	74,646	14,929	<0.41
Chromium (+3)	3,818,000	770,261,253	154,052,251	<1.1
Lead	140	28,244	5,649	<1.4
Nickel	43,000	8,675,022	1,735,004	<1.5

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 31 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13	2,016	403	<7.7

Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not required, but chloride monitoring is recommended. Limits and/or monitoring recommendations are in the paragraphs below:

Copper – Considering available effluent data in the permit application from April 2025 to May 2025, mean concentration is 2.1 µg/L, with a maximum concentration of 6.3 µg/L. The maximum effluent concentration and the mean of the effluent data did not exceed the calculated 1/5th of the daily maximum limit**; therefore, concentration and mass limits, as well as monthly monitoring, are not required.**

Chloride – Considering available effluent data from the current permit term from January 2024 to December 2024, the 1-day P_{99} chloride concentration is 380 mg/L, and the 4-day P_{99} of effluent data is 290 mg/L.

These effluent concentrations are below the calculated WQBELs for chloride; therefore, no effluent limits are needed. **Chloride monitoring is recommended to continue, 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 the Blanchardville Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from October 2021 to September 2024 was 0.40 mg/kg, with a maximum reported concentration of 0.55 mg/kg. Therefore, **no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of discharge, the effluent flow rate, and the unknown levels of PFOS/PFOA in the source water **PFOS and PFOA monitoring is not recommended.**

The Department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

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

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004, which includes criteria based on both acute and chronic toxicity to aquatic life. Given the fact that the Blanchardville Wastewater Treatment Facility does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

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 499 sample results were reported from October 2020 to September 2025. The maximum reported value was 7.7 s.u. (Standard pH Units). The effluent pH was 7.6 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.7 s.u. The mean plus the standard deviation multiplied by a factor of

2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.7 s.u. Therefore, a value of 7.7 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.7 s.u. into the equation above yields an ATC = 14.4 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method
In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the 1-Q_{10} receiving water low flow if it is determined that the previous method of acute ammonia limit calculation (2×ATC) is not sufficiently protective of the fish and aquatic life. The more restrictive calculated limits shall apply.

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

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	29
1-Q_{10}	2,716

The 2×ATC method yields the most stringent limits for Blanchardville Wastewater Treatment Facility.

Presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

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 calculations from the WQBEL memo dated July 22, 2009 are shown in attachment #3. With a decrease in design flow the calculated limits would be higher, and since **there is no reasonable potential the limits will not be evaluated further.**

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from January 2024 to December 2024.

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
1-day P_{99}	1.0
4-day P_{99}	0.6
30-day P_{99}	0.24
Mean*	0.11
Std	0.27
Sample size	41
Range	<0.08 - 1.3

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

Reasonable Potential
The need to include ammonia limits in the Blanchardville Wastewater Treatment Facility permit is determined by calculating 99th upper percentile (or P_{99}) values for ammonia and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits.

No limits are needed however monitoring is recommended.

Conclusions and Recommendations
In summary, after rounding to two significant figures, ammonia nitrogen concentrations and mass limitations are not required but **monitoring is recommended. Frequency of monitoring is at the discretion of the permit drafter.**

PART 4 – PHOSPHORUS

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

Since the Blanchardville Wastewater Treatment Facility has phosphorus limits in effect that are as stringent as 1.0 mg/L, the need for a TBEL will not be considered further.

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

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

WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

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

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

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

Where:

WQC = 0.075 mg/L for East Branch of Pecatonica River
Qs = 100% of the 7-Q_2 of 67 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.132 MGD = 0.204 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

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

A previous evaluation resulted in a WQBEL of 0.075 mg/L using a background concentration of 0.123 mg/L taking the mean of all 3 median background concentrations. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. Additional data were considered in estimating the background phosphorus concentration.

A review of all available in stream total phosphorus data stored in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration in East Branch of Pecatonica River just upstream from the point of discharge is above criteria. The following data were considered in estimating the background phosphorus concentration.

The following data were considered in estimating the background phosphorus concentration:

SWIMS ID	10031442	333249	10031441
Station Name	Monitoring station at East Branch Pecatonica River 150 ft. N. of Pine St. and Railroad St. (at boat launch)	Monitoring station at Pecatonica R East Branch - Foot Bridge Off Water St (Cth H) Blanchardville	Monitoring station at East Branch Pecatonica River 100 m downstream of Gordon Creek
Waterbody	East Branch Pecatonica River	East Branch Pecatonica River	East Branch Pecatonica River
Sample Count	5	27	5
First Sample	07/19/2010	07/14/2005	07/19/2010

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Last Sample	10/18/2010	10/11/2021	10/18/2010
Mean	0.095 mg/L	0.149 mg/L	0.077 mg/L
Median	0.095 mg/L	0.151 mg/L	0.070 mg/L

Substituting a background concentration above criteria into the limit calculation equation above would result in a calculated limit that is less than the applicable criterion of 0.105 mg/L, which is the calculated mean of the three median background concentrations. However, s. NR 217.13(7), Wis. Adm. Code, specifies that "if the WQBEL calculated pursuant to the procedures in this section is less than the phosphorus criterion specified in s. NR 102.06, Wis. Adm. Code, for the water body, the effluent limit shall be set equal to the criterion."

The impaired water listing of East Branch of Pecatonica River from the point of discharge also points towards the notion that effluent phosphorus limits equal to the water quality criterion are needed to prevent the discharge from contributing to further impairment of the receiving water. *The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020)* suggests setting effluent limits equal to the criterion in the absence of an EPA approved total maximum daily load for discharges of phosphorus to phosphorus impaired waters.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from October 2020 to September 2025. Blanchardville Wastewater Treatment Facility installed a chemical feed in 2024 so data is broken

Total Phosphorus Effluent Data

	Phosphorus (before 2024) mg/L	**Phosphorus (before 2024) lbs/month**
1-day P_{99}	8.0	58
4-day P_{99}	5.9	48
30-day P_{99}	4.9	42
Mean	4.3	39
Std	1.2	7.0
Sample size	338	36
Range	1.6 - 8.9	26 – 57

	Phosphorus (after 2024) mg/L	**Phosphorus (after 2024) lbs/month**
1-day P_{99}	7.0	60
4-day P_{99}	3.8	33
30-day P_{99}	1.8	17
Mean	1.0	11
Std	1.5	12
Sample size	184	21
Range	0.1 - 6.9	2.0 - 42

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

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

Mass Limits
A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the discharge is to a surface water that is to or upstream of a phosphorus impaired water. **This final mass limit shall be 0.075 mg/L × 8.34 × 0.099 MGD = 0.062 lbs/day expressed as a six-month average.**

Multi-Discharge Variance Interim Limit
With the permit application, Blanchardville Wastewater Treatment Facility has re-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. The recommended interim limit during the 2nd permit under MDV approval, pursuant to s. 283.16 (6) (a), Wis. Stats., is 0.6 mg/L as a monthly average. A compliance schedule may be appropriate to meet this interim limit but compliance with 0.6 mg/L shall be no later than the end of the reissued permit. The previous interim limit of 1.0 mg/L should not be exceeded during the compliance schedule.

PART 5 – 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). There is no reasonable potential for the discharge to exceed this limit; therefore, **no limits or monitoring are recommended.**

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and

effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document* (2022).

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.

- Chronic testing is usually not recommended where the ratio of the 7-Q_{10} to the effluent flow exceeds 100:1. For the Blanchardville Wastewater Treatment Facility that ratio is approximately 234:1. With this amount of dilution, there is believed to be little potential for chronic toxicity effects in the East Branch of Pecatonica River associated with the discharge from the Blanchardville Wastewater Treatment Facility so the need for chronic WET testing will not be considered further.

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
AMZ/IWC	Not applicable. **0 Points**
Historical Data	No data available within the last 5 years. **5 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**
Receiving Water Classification	WWSF . **5 Points**
Chemical-Specific Data	No reasonable potential for limits based on ATC; Ammonia nitrogen, copper, zinc, and chloride detected. **3 Points**
Additives	No biocides and 1 water quality conditioner added. Permittee does not have proper P chemical SOPs in place **16 Points**

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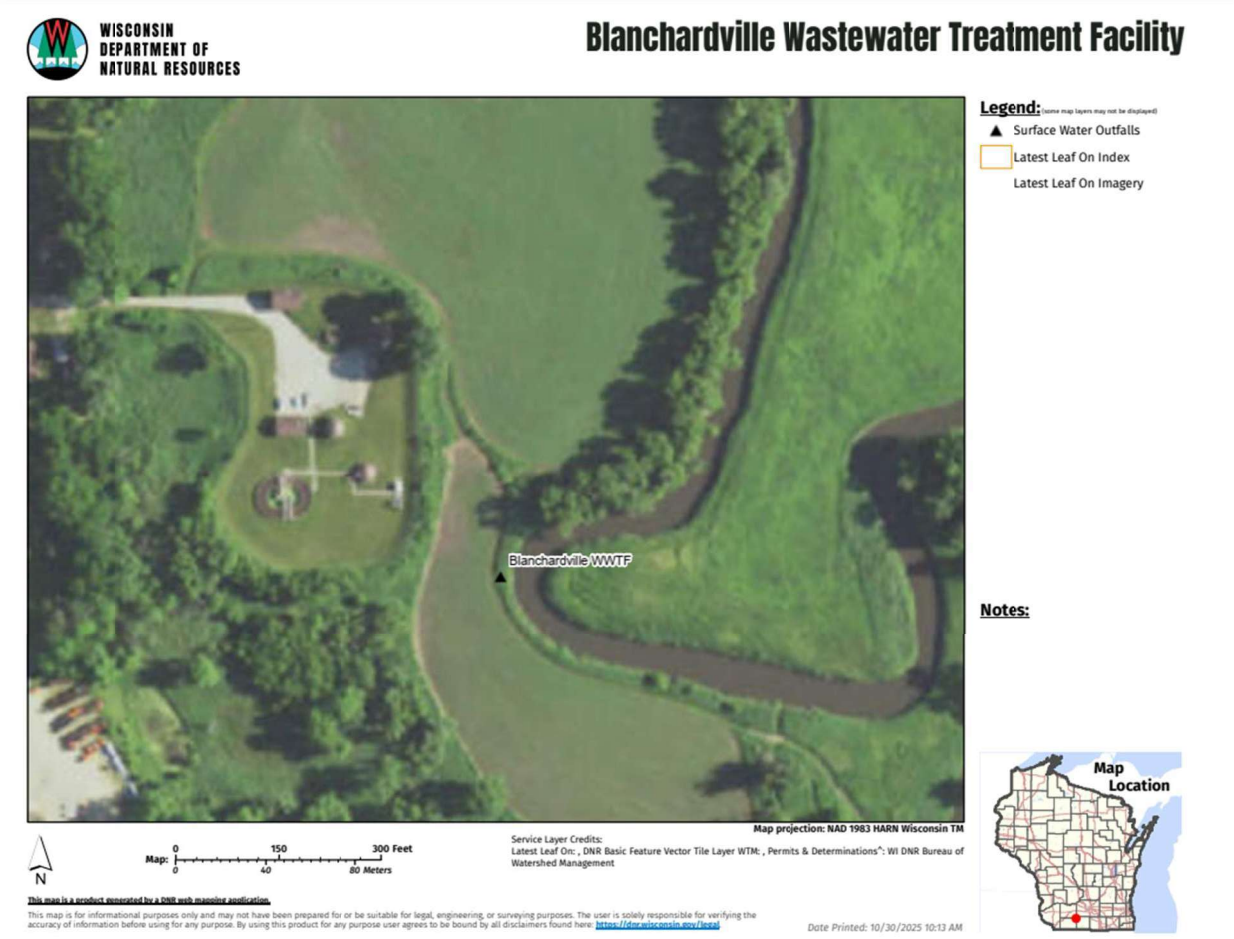
	Acute
Discharge Category	No industrial contributors. **0 Points**
Wastewater Treatment	Secondary or better. **0 Points**
Downstream Impacts	No impacts known. **0 Points**
Total Checklist Points:	**29 Points**
Recommended Monitoring Frequency (from Checklist):	3 tests during permit term
Limit Required?	No
TRE Recommended? (from Checklist)	No

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, **3 acute WET tests are recommended in the reissued permit.** Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge.

- **If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute WET testing is not required.**

Site Map:


WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Blanchardville Wastewater Treatment Facility
Blanchardville WWTF
Legend:
Surface Water Outfalls
Latest Leaf On Index
Latest Leaf On Imagery
Notes:
Map Location
Map projection: NAD 1983 HARN Wisconsin TM
Map: 0 150 300 Feet
0 40 80 Meters
N
Service Layer Credits:
Latest Leaf On: , DNR Basic Feature Vector Tile Layer WTM: , Permits & Determinations^: WI DNR Bureau of Watershed Management
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Date Printed: 10/30/2025 10:13 AM

Ammonia Nitrogen Calculations from WQBEL Memo dated July 22, 2009

The following sections summarize the effluent quality and associated monthly limitations calculated in accordance with chs. NR 105, and 106 (Wis. Adm. Code).

AMMONIA (as N) LIMITS		
CLASSIFICATION	**WARMWATER**	
EFFLUENT FLOW (MGD)	0.1316	
EFFLUENT FLOW (cfs)	0.204	
MAX. EFFLUENT pH (s.u.)	7.80	
BACKGROUND INFORMATION:	***summer***	***winter***
7-Q_{10} (cfs)	48	48
7-Q_2 (cfs)	67	67
Ammonia (mg/L)	0.06	0.19
Temperature (deg C)	23	3
pH (std. units)	8.21	7.97
% of river flow used	100	25
Reference weekly flow	48	12
Reference monthly flow	56.95	14.2375
CRITERIA (in mg/L)		
Acute (@ effl. pH)	12.14	12.14
4-day Chronic (@ backgrd. pH)		
early life stages present	2.55	6.35
early life stages absent	2.55	10.31
30-day Chronic (@ backgrd. pH)		
early life stages present	1.02	2.54
early life stages absent	1.02	4.12
EFFLUENT LIMITS (in mg/L)		
Daily maximum	24.28	24.28
Weekly average		
early life stages present	590.34	369.40
early life stages absent		606.80
Monthly average		
early life stages present	269.91	166.87
early life stages absent		279.24

Note: Early life stages present limits apply during the months of April through September and the early life stages absent limits apply to October through March for warm water sport fish community streams where burbot are not expected to be present.

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

Village of Blanchardville

WPDES Permit Number	County
WI- 0 | 0 | 2 | 1 | 1 | 0 | 5	Lafayette

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	3.51	(•) 30-day P99 ( ) Other, specify:	( ) Yes (•) No, why not: Application used more recent dataset	*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?

0.6 mg/L as a monthly average, pursuant to s. 283.16(6)(a)2., Wis. Stats.
Target Value = 0.2 mg/L

Provide Rationale:

Phosphorus effluent data from the past three years (10/1/2022 - 9/30/2025, n=314) yield a 30-day P99 value of 3.51 mg/L. This value is not representative of current treatment capabilities however, because Blanchardville added chemical treatment in spring of 2024. Effluent data since that time have generally been below the proposed 0.6 mg/L target value, so a schedule is unlikely to be warranted.

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.

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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:	$ 3,492,310.00 2019 Final Compliance Alternatives Plan Capital Costs	*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:

A March 2019 phosphorus compliance alternatives plan was authored by Town & Country Engineering and submitted on behalf of Blanchardville. The document addresses planning considerations for the low-level phosphorus WQBEL applicable at the Blanchardville WWTP. A total of 10 alternative solution combinations were evaluated. Water quality trading or adaptive management may be an option for Blanchardville, however, it is generally deemed cost-prohibitive and no trading partners have been identified. During the current permit term, Blanchardville installed chemical phosphorus removal. Several types of tertiary filtration are evaluated and provided site-specific cost estimates. The lowest cost option, disk filtration, is 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.*

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Comments on economic demonstration:

The lowest-cost feasible means for complying with the phosphorus WQBEL was identified as chemical addition followed by disk filtration. Although the estimate was done in 2019, this type of treatment system for meeting low-level WQBELs is still seen as amongst the most cost effective to employ as of 2025. Capital costs for this option were estimated to be $3,492,310.00. O&M increases associated with this system are estimated at $96,821.00 annually. These values are somewhat higher than the statewide assessment values generated for the phosphorus economic impact analysis (EIA Analysis Addendum Appendix G). EIA values were estimated at $1.9 M capital costs and $35 K O&M costs. Given recent increases in prices, the O&M discrepancy is fairly small. Captial costs financed with a 2.6% CWFP loan result in annual payments of $225,718.06. Total cost increase comes to $322,539.06 after O&M. The residential share (90%) is $290,285.16. Divided amongst 330 customer households, the average per-user cost increase is $879.65. With current rates at $1145.00, projected average annual sewer rates are $2024.65. This value is 3.59% of Blanchardville's $56,406 median household income. In Lafayette County with a secondary indicator score of 5, projected sewer rates at 1% of MHI meet the primary screener. The applicant meets the primary screener.

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:

Save

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is: $ 66.62

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

Additional Justification (if needed):

Certification

Preparer Name	Title
Matt Claucherty	Water Resources Management Specialist

Signature of Preparer	Date

Save

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

Tony Evers, Governor
Karen Hyun, Ph.D., Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

10/14/2025

Paul Garthwaite, Public Works Chair
208 Mason Street
Blanchardville, WI 53516

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: East Branch of the Pecatonica River in Lafayette County
Permittee: Village of Blanchardville, WPDES WI-0021105

Dear Mr. Garthwaite:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for the Blanchardville Wastewater Treatment Facility in an application dated 7/3/2025. Wisconsin's multi-discharger phosphorus variance was approved by EPA on September 3, 2025. 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 Nate Dammen, Village of Blanchardville
Caitlin Oconnell, WDNR
Betsyjo Howe, WDNR
Michelle Woods, EPA Region 5
Tim Elkins, EPA Region 5