Permit Fact Sheet

General Information

Permit Number	WI-0022047-11-0
Permittee Name and Address	Village of Whitelaw PO Box 294, Whitelaw, WI 54247-0294
Permitted Facility Name and Address	Whitelaw Wastewater Treatment Facility 312 N Hickory St, Whitelaw, Wisconsin
Permit Term	January 01, 2027 to December 31, 2031
Discharge Location	SW ¼ of the NE ¼ of Sec. 2, T19N, R22E, Manitowoc County (N 44° 08' 49" W 87° 49' 45")
Receiving Water	Unnamed Tributary to Hempton Lake located in the Branch River Watershed of the Lakeshore Basin in Manitowoc County
Stream Flow ($Q_{7,10}$)	0 cfs
Stream Classification	Limited Aquatic Life (LAL) community, non-public water supply and recreational use from the outfall to Hempton Lake (approximately 1.5 miles). Hempton Lake is classified as a warmwater sport fish (WWSF) community.
Discharge Type	Existing Continuous Discharge
Annual Average Design Flow (MGD)	0.150
Industrial or Commercial Contributors	None
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; L - Laboratory; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Whitelaw owns and operates the Whitelaw Wastewater Treatment Facility (WWTF) that treats residential and commercial domestic wastewater from the Village sanitary sewer collection system and hauled in wastewater from domestic holding tank systems outside of the sewer service area accepted at the septage receiving station. The WWTF is designed with an average annual design flow of 0.150 MGD. Class B sludge generated from the treatment facility is either land applied on department approved sites or hauled to another permitted facility. The paragraphs below describe the liquid and solids treatment train of the Whitelaw WWTF.

Liquid Treatment Train: The facility provides preliminary and secondary treatment to the combined influent from Village of Whitelaw and accepted hauled in domestic wastewater at the septage receiving station. Preliminary treatment consists of influent pumping and fine screening. Secondary treatment processes include activated sludge treatment with an oxidation ditch with two channels, chemical phosphorus removal with Neo Water FX 300, and secondary clarification. The final treated effluent then flows by gravity through to the outfall structure to the Unnamed Tributary to Hempton Lake via Outfall 001.

Solids Treatment Train: The solids treatment includes aerobic digestion and storage. All the generated waste activated sludge from the final clarifier is sent to the aerobic digestor tank. The aerobically digested liquid sludge is then pumped to a sludge storage tank. The stored liquid sludge can be hauled by truck to be land applied on department approved sites via Outfall 006 as Class B liquid sludge or hauled to another permitted facility.

Substantial Compliance Determination

After a desktop review of all discharge monitoring reports, compliance annual reports, land application reports, compliance schedule items, and a site visit on May 21, 2026, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Trevor Moen, Wastewater Engineer, on September 29, 2026.

Fact Sheet Organization

This fact sheet explains the rationale and assumptions used in deriving the conditions and requirements set forth in this permit. Additionally, this fact sheet highlights changes in permit conditions that the department proposes to make when reissuing the WPDES permit. This fact sheet compares conditions in the previous permit to those in the reissued permit. The previous permit remains in effect until the permit is reissued. The tables that follow were taken from the permit and are numbered in this fact sheet as they are numbered in the permit. Highlighted text and cells within tables indicate permit conditions that are new or different from those found in the previous permit.

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	Daily Average: 0.108 MGD (July 2021 to July 2026)	INFLUENT - Combined influent from the sanitary sewage collection system and septage receiving station. At Sample Point 701, the permittee shall collect 24-hour flow proportional composite samples of the combined influent from the influent lift station wet well. The permittee shall measure the influent flow rate using a continuous flow recording device following the influent lift station.
001	Not applicable – There is no effluent flow meter at this time.	EFFLUENT - At Sample Point 001, the permittee shall collect 24-hour flow proportional composite samples of the effluent after the final clarifier prior to disinfection (once installed) and grab samples of the effluent after disinfection (once installed) and prior to being discharged to an unnamed tributary to Hempton Lake via Outfall 001. The permittee shall measure the effluent flow rate using a continuous flow recording device at a representative location after the final clarifier per the Install Continuous Flow Recording Device Schedule.
006	Average Annual Sludge Generated: 300,500 gallons (2021 to 2025) Average Annual Sludge Land Applied: 13.8 metric tons (2021 to 2025)	LIQUID SLUDGE: Aerobically digested liquid sludge that has been stored. At Sample Point 006, the permittee shall collect representative grab and/or composite samples of the liquid sludge from the storage tank after mixing annually for metals (List 1) and PFAS regardless if the liquid sludge will be land applied or not each year. Additionally, the permittee shall monitor annually for nutrients (List 2), Class B pathogen control requirements (List 3), and vector attraction reduction (List 4) if the liquid sludge will be land applied to department approved sites via Outfall 006 in any year.

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:

- No changes from the previous permit.

1.1.2 Explanation of Limits and Monitoring Requirements

Flow Rate, BOD_5, and TSS: Monitoring of influent flow, BOD_5, and TSS 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. Influent monitoring for BOD_5 and TSS remains unchanged from the previous permit.

Sampling Frequency: The department shall determine on a case−by−case basis the monitoring frequency to be required for each parameter in a permit pursuant to s. NR 205.066, Wis. Adm. Code. The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual WPDES permits based on the size and type of the facility, in order to characterize influent 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. Previously permitted monitoring frequencies for BOD_5 and TSS are consistent with the minimum monitoring frequency outlined in guidance. The sampling frequencies for BOD_5 and TSS remain unchanged from the previous permit. See the attached monitoring frequency evaluation for more information. This guidance states for influent flow rate the standard sampling frequency must be daily.

Sample Type: The department shall require the use of 24−hour flow proportional samplers for monitoring influent wastewater quality except where the department determines through the permit issuance process that other sample types may adequately characterize the influent quality pursuant to s. NR 210.04(4), Wis. Adm. Code. The 24-hour flow proportional sampling is the most representative method of collecting wastewater samples for wastewater coming into and being discharged from a wastewater treatment plant on a continuous basis. For municipal waste at a treatment facility, methods of flow measurement shall include a continuous recording device pursuant to s. NR 218.05(1), Wis. Adm. Code. The sample type for flow rate, BOD_5 and TSS remains unchanged from the previous permit.

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	The permittee shall report the flow rate starting on April 1, 2031. See also the Install Continuous Flow Recording Device Schedule.
BOD_5, Total	Monthly Avg	20 mg/L	2/Week	24-Hr Flow Prop Comp	
BOD_5, Total	Weekly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	19 lbs/day	2/Week	Calculated	See the TMDL Limitations section in the permit.
Suspended Solids, Total	Weekly Avg	26 lbs/day	2/Week	Calculated	See the TMDL Limitations section in the permit.
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate and report the total monthly mass of TSS discharged in lbs/month on the last day of the month on the eDMR.
Suspended Solids, Total		lbs/yr	Monthly	Calculated	Calculate and report the 12-month rolling sum of the total monthly mass of TSS on the last day of the month on the eDMR.
Dissolved Oxygen	Daily Min	4.0 mg/L	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
pH Field	Daily Min	6.0 su	Daily	Grab	
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only required in 2030.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total		mg/L	Weekly	24-Hr Flow Prop Comp	Monitoring only. See Ammonia Limit Not Needed - Continue to Optimize Removal of Ammonia section in the permit.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section in the permit.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section in the permit.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section in the permit. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	0.82 lbs/day	Weekly	Calculated	See the TMDL Limitations section in the permit.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate and report the total monthly mass of TP discharged in lbs/month on the last day of the month on the eDMR.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate and report the 12-month rolling sum of the total monthly mass of TP on the last day of the month on the eDMR.

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	Monitoring and limit effective May through September annually per the Disinfection and Effluent Limitations for E. coli compliance schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September annually per the Disinfection and Effluent Limitations for E. coli compliance schedule. See the E. coli Percent Limit section in the permit. Enter the result in the eDMR on the last day of the month.
PFOS		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Sampling and Reporting Requirements section and PFOS/PFOA Minimization Plan Determination of Need section and compliance schedule in the permit.
PFOA		ng/L	1/ 2 Months	Grab	Monitoring only. See PFOS/PFOA Sampling and Reporting Requirements section and PFOS/PFOA Minimization Plan Determination of Need section and compliance schedule in the permit.

2.1.1 Changes from Previous Permit

- Addition of effluent flow rate monitoring and reporting beginning on April 1, 2031.
- The sample frequency for pH has been changed from “5/Week” to “Daily”.
- Escherichia coli (E. coli) monitoring and limits have been added and will become effective per a compliance schedule.
- PFOS and PFOA monitoring once every two months is included in the permit in accordance with s. NR 106.98(2)(c), Wis. Adm. Code.

2.1.2 Explanation of Limits and Monitoring Requirements

More information and explanation about the proposed water quality-based effluent limits (WQBELs) is found in the "Water Quality-Based Effluent Limitations for the Whitelaw Wastewater Treatment Facility WPDES Permit No. WI-0022047-11" memo dated September 28, 2026.

Flow Rate Monitoring: For municipal waste at a treatment facility, methods of flow measurement shall include a continuous recording device pursuant to s. NR 218.05(1), Wis. Adm. Code.

BOD_5, TSS, pH, and DO: Publicly owned treatment works with a discharge to a surface water classified as a LAL water shall meet the secondary treatment effluent limits specified for BOD_5, TSS, pH, and DO in s. NR 210.05(3), Wis. Adm. Code, excluding the TSS mass limits. The permittee discharges to the Unnamed Tributary to Hempton Lake which is classified as a LAL water. Therefore, effluent limitations in s. NR 210.05(3), Wis. Adm. Code, apply and remain unchanged from the previous permit.

TMDL derived TSS Mass Effluent Limitations: If the department determines a limitation is necessary, effluent limitation shall be also consistent with a total maximum daily load (TMDL) if a TMDL has been approved by the U.S. Environmental Protection Agency (USEPA) for the receiving waterbody consistent with s. NR 205.067(3)(a), Wis. Adm. Code. The discharge is to the Unnamed Tributary to Hempton Lake which is within the Northeast Lakeshore Basin TMDL area. The Northeast Lakeshore Basin TMDL for total phosphorus and total suspended solids was approved by the USEPA on October 30, 2023. The department has determined that TSS effluent limitations are necessary. Therefore, the department must calculate TMDL derived TSS limits to be consistent with the Northeast Lakeshore Basin TMDL. The approved total suspended solids waste load allocation (WLA) for the permittee is 4,841 lbs/year which results in calculated total suspended solids mass limits of 26 lbs/day as a weekly average and 19 lbs/day as a monthly average. Since the TSS WLA is expressed as an annual load (lbs/yr), the permittee must also calculate and report the rolling 12-month sums of total monthly loads for TSS. Rolling 12-month sums can be compared directly to the annual wasteload allocation. The TSS mass effluent limits remain unchanged from the previous permit.

Chloride: Effluent chloride concentrations are below the calculated WQBELs; therefore, limits are not required. However, monthly monitoring is required in 2030 to ensure that 11 sample results are available at the next permit reissuance to meet the reasonable potential data requirements of s. NR 106.85, Wis. Adm. Code.

Ammonia Nitrogen: Ammonia limits were calculated using 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 establishes the procedure for calculating WQBELs for ammonia. Effluent ammonia nitrogen concentrations are below the calculated WQBELs; therefore, effluent limits are not required. However, weekly monitoring for ammonia nitrogen is required to continue in the permit as monitoring the effluent ammonia nitrogen concentration is essential for optimization, process control, and design capabilities of the wastewater treatment facility.

Nitrogen Series Monitoring (NO2+NO3, TKN and Total N): The department has included annual effluent monitoring for total nitrogen in rotating quarters since the permittee is a minor discharge (<1 MGD) in the permit through the authority under s. 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. 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.

Total Phosphorus: Phosphorus requirements are based on the Phosphorus Rules as detailed in chs. NR 102 (water quality standards) and NR 217, Wis. Adm. Code (effluent standards and limitations for phosphorus). Chapter NR 217 of the Wis. Adm. Code, addresses point source dischargers of phosphorus to surface waters. Currently, there are three types of limit calculations used to determine if a phosphorus limit is needed: a technology based effluent limit (TBEL), a WQBEL determined by stream criteria and an effluent limit based on a TMDL allocation.

- A TBEL of 1.0 mg/L is needed if a facility discharges more than the threshold of 150 pounds per month (s. NR 217.04(1)(a)1., Wis. Adm. Code). The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month. However, an interim limit of 1.0 mg/L went into effect per the MDV compliance schedules and will remain in effect pursuant to ch. NR 207, Wis. Adm. Code,

unless a more stringent limit is required at a future permit issuance by ss. NR 217.13 and NR 217.16(2), Wis. Adm. Code.

- Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to LAL waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. However, sections NR 217.12 and NR 217.13, Wis. Adm. Code, state that the department must set WQBELs to protect downstream waters. The surface water downstream of the point of discharge is Hempton Lake which is classified as a stratified drainage lake. Section NR 102.06(4)(b), Wis. Adm. Code, specifies for stratified drainage lakes a phosphorus criterion of 0.030 mg/L. The phosphorus criterion of 0.030 mg/L applies to Hempton Lake. The department calculated final total phosphorus WQBELs based on the phosphorus criterion consistent with s. NR 217.13, Wis. Adm. Code, and final total phosphorus WQBELs are determined to be 0.09 mg/L as a monthly average, 0.03 mg/L as a six-month average, and 0.029 lbs/day as a six-month average. These limits had yet to take effect per the multi-discharger variance in the previous permit. The department has determined to include the total phosphorus TMDL derived limitations in lieu of the WQBELs calculated under s. NR 217.13, Wis. Adm. Code, pursuant to s. NR 217.16, Wis. Adm. Code.
- The discharge is to the Unnamed Tributary to Hempton Lake which is within the Northeast Lakeshore Basin TMDL area. The Northeast Lakeshore Basin TMDL for total phosphorus and total suspended solids was approved by the USEPA on October 30, 2023. If the department determines a WQBEL is necessary, limitations shall be consistent with a TMDL if a TMDL has been approved by the USEPA for the receiving waterbody consistent with s. NR 205.067(3)(a), Wis. Adm. Code. The department has determined that total phosphorus WQBELs are necessary. Therefore, the department must also calculate TMDL derived total phosphorus limits to be consistent with the Northeast Lakeshore Basin TMDL. The approved total phosphorus WLA for the permittee is 157 lbs/year. Since the equivalent concentration is greater than 0.3 mg/L, the WLA should be expressed as a monthly average mass limit for total phosphorus and no six-month average limit is required. The department calculated a total phosphorus mass limit of 0.82 lbs/day as a monthly average. Since the total phosphorus WLA is expressed as an annual load (lbs/yr), the permittee must also calculate and report the rolling 12-month sums of total monthly loads for total phosphorus. Rolling 12-month sums can be compared directly to the annual wasteload allocation. The total phosphorus mass effluent limits remain unchanged from the previous permit.

E. coli: Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective on 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 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.

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

The permittee discharges to the Unnamed Tributary to Hempton Lake which the permittee must ensure is suitable for supporting recreational use and protect humans from illness caused by fecal contamination due to recreational contact with surface water. The Unnamed Tributary to Hempton Lake is not classified as a public water supply. Therefore, the permittee is only required to disinfect during the recreation season pursuant to s. NR 210.06(1)(a), Wis. Adm. Code.

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 in order to protect the recreation season (May to September): The geometric mean of E. coli bacteria in effluent samples collected in any calendar month cannot exceed 126 counts/100 mL. No more than 10% of E. coli bacteria samples collected in any calendar month can exceed 410 counts/100 mL.

The permittee has not monitored for E. coli during the previous permit term and currently does not have a disinfection system to meet the final E. coli effluent limitations. Therefore, the department has included a compliance schedule to allow the permittee time to install a disinfection system to meet the final E. coli effluent limitations.

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on available PFOS and PFOA sludge monitoring data (PFOS of 30.4 µg/kg and PFOA of 89.2 µg/kg in 2025), PFOS and PFOA monitoring is recommended at a once every two months frequency. A sample frequency of 1/2 months means one sample is taken during any two-month period. Examples of 1/2 month sample would be every other month (Jan, March, May, etc.) or back-to-back months with a break in between (February & March, May & June, Aug & Sept, etc.). DMR Short Forms will be generated for the following time periods: January-February, March-April, May-June, July-August, September-October, and November-December. At a minimum one sample result will be present on each form.

The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

Sampling Frequency: The department shall determine on a case−by−case basis the monitoring frequency to be required for each parameter in a permit pursuant to s. NR 205.066, Wis. Adm. Code. The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual WPDES 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.

Previously permitted monitoring frequencies for BOD_5 and TSS are consistent with the minimum monitoring frequency outlined in the guidance. The sampling frequencies for BOD_5 and TSS remain unchanged from the previous permit. Monitoring frequency for DO, ammonia nitrogen, total phosphorus, E. coli is consistent with the standard monitoring frequency. Previously permitted monitoring frequency for pH falls below the standard monitoring frequency outlined in the guidance document. The department has determined at this time to increase the monitoring frequency for pH to be consistent with standard monitoring frequencies outlined in the guidance document. See the attached monitoring frequency evaluation for more information

Sample Type: The department shall require the use of 24−hour flow proportional samplers for monitoring effluent wastewater quality except where the department determines through the permit issuance process that other sample types may adequately characterize the effluent quality pursuant to s. NR 210.04(4), Wis. Adm. Code. The 24-hour flow-proportional sampling is the most representative method of collecting wastewater samples for wastewater coming into and being discharged from a wastewater treatment plant on a continuous basis. Grab samples for pH, DO, and E. coli are required as compositing and holding such samples would change the test results and is noncompliant with maximum holding times specified in ch. NR 219, Wis. Adm. Code. The sample type for all parameters remains unchanged from the previous permit.

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)**
006	B	Liquid	Fecal	Injection	Land Application	13.8 metric tons (Avg, 2021-2025)
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. If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility						
Is a priority pollutant scan required? No. Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

3.1 Sample Point Number: 006- LIQUID SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
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	
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections in the permit for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections in the permit for more information.

3.1.1 Changes from Previous Permit:

- Annual PFAS monitoring has been added to the permit.
- PCB monitoring once during the permit term has been removed.

3.1.2 Explanation of Limits and Monitoring Requirements

Metals, Nutrients, Pathogen Control, Vector Attraction Reduction: The parameters to be analyzed in the sludge were determined pursuant to s. NR 204.06(2)(b), Wis. Adm. Code. The ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5), Wis. Adm. Code. Requirements for pathogen control are specified in s. NR 204.07(6), Wis. Adm. Code, and in s. NR 204.07(7), Wis. Adm. Code, for vector attraction reduction requirements. Nutrients are required to be analyzed to track that nutrient recommendations for the crop are not exceeded. Specifically, the amount of available nitrogen from sludge and other nitrogen sources applied per growing season may not exceed the nitrogen requirement of the crop pursuant to s. NR 204.07(8)(a), 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.

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

2025 Wisconsin Act 201 was enacted on April 6, 2026 to address monitoring for PFAS in sewage sludge. The Act created s. 283.82(4), Wis. Stats., and requires the department to include PFOA & PFOS limitations or conditions in WPDES permits for the land application of sewage sludge. The department's implementation strategy is outlined in the "Interim Strategy for Land Application of Biosolids and Industrial Sludges containing PFAS". The Department intends to periodically review and update this interim strategy. See the PFAS Land Application Requirements permit section for more information about the limitations in this permit.

Sample Frequency: The frequency of monitoring for metals, nutrients, pathogen control, and vector attraction reduction requirements of the sludge is based on the amount of sludge land applied each year pursuant to s. NR 204.06(2)(c)3., Wis. Adm. Code. The facility land applied an annual average of 13.8 dry metric tons per year (2021 to 2025). This result is less than 290 dry metric tons of sludge each year based on Table A in s. NR 204.06(2)(c)3., Wis. Adm. Code, which results in a sampling frequency of once per year. The sample frequency remains unchanged from the previous permit.

PCB monitoring: PCB monitoring is not required this permit term but will be included in the next reissuance. There are no potential industrial sources and a review of historic PCB data shown results well below high quality and ceiling limitations as stated in s. NR 204.07(3)(k), Wis. Adm. Code.

4 Schedules

4.1 Install Continuous Flow Recording Device

The permittee shall install a continuous flow recording device at Sample Point 001(Effluent) in accordance with the following schedule.

Required Action	Due Date
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code.	04/30/2028
Plans and Specifications: Submit plans and specifications per ch. NR 108, Wis. Adm. Code, for installing a continuous flow recording device at Sample Point 001 (Effluent).	03/31/2029
Complete Install: The permittee shall complete installation of the continuous flow recording device at Sample Point 001 (Effluent).	03/31/2031

4.1.1 Explanation of Schedule

The permittee currently measures the influent flow rate but not the effluent flow rate. However, pursuant to s. NR 218.05(1), Wis. Adm. Code, for municipal waste at a treatment works, including any bypass, methods of flow measurement shall include continuous recording devices. This schedule requires the permittee to install a continuous effluent flow recording device to comply with s. NR 218.05(1), Wis. Adm. Code.

4.2 Disinfection and Effluent Limitations for E. coli

The permittee shall install disinfection treatment and comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification.

Required Action	Due Date
Progress Report: The permittee shall submit a progress report on development and submittal of a facility plan for upgrades to meet disinfection requirements and E. coli limits.	09/30/2027
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2028
Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to meet disinfection requirements per s. NR 210.06(1), Wis. Adm Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2029
Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	09/30/2029

Required Action	Due Date
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2030
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2031
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	04/30/2031

4.2.1 Explanation of Schedule

A compliance schedule is included in the permit to provide time for the permittee to submit a facility plan, final construction plans and specifications, and install the disinfection treatment system for meeting effluent E. coli water quality-based effluent limits and disinfection requirements pursuant to s. NR 210.06, Wis. Adm. Code.

4.3 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.	12/31/2027
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	12/31/2028

4.3.1 Explanation of Schedule

As stated above, NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. S. NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to

determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge. If the department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

4.4 Sludge PFOS/PFOA Minimization Plan

Required Action	Due Date
Sludge PFOS/PFOA Minimization Plan Submittal: The permittee shall submit for department review and approval a sludge PFOS/PFOA minimization plan to reduce concentrations of PFOS/PFOA in the sewage sludge. This plan shall include a schedule for identification and monitoring of potential sources and actions for reducing and/or eliminating identified sources. Upon receiving approval, the permittee shall implement the actions identified in the plan.	12/31/2027

4.4.1 Explanation of Schedule

Due to high levels of combined PFOA+PFOS in the sewage sludge, a minimization plan is needed to identify sources of PFOS and PFOA in sewage sludge and establish a plan to reduce concentrations in the treatment system pursuant to s. 283.82(4)(a), Wis. Stats.

4.5 Sludge Management Plan

A management plan is required for the sludge management program.

Required Action	Due Date
Sludge Management Plan Submittal: Submit a management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, 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 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.	12/31/2027

4.5.1 Explanation of Schedule

Per s. NR 204.11(1), Wis. Adm. Code, the department may require the permittee to develop a sludge management plan, submit the plan to the department for approval and operate in compliance with the approved plan. The plan shall include a description of the facility's sludge management program and how the permittee plans to operate the facility in compliance with the requirements of the permit and ch. NR 204, Wis. Adm. Code. The sludge management plan shall be submitted to the department for approval by the due date in the permit.

5 Standard Requirements

The Standard Requirements section contains conditions and requirements that are, for the most part, applicable to all municipal permittees consistent with ss. NR 205.07(1) and NR 205.07(2), Wis. Adm. Code. Other standard requirements may be added as reminders.

Changes from Previous Permit:

- Section 5.1.1: The department has updated this section to include a definition of calendar week on how to demonstrate compliance with the sampling frequency requirements.
- Section 5.1.3: The department has added this section to include the definitions of sample types.
- Section 5.1.5: The limit of quantitation was updated for TSS for purposes of calculating NR 101 fees.
- Section 5.4.7: The department has added a reminder about the expression of the E. coli limits and to enter a value of 1 for a result of 0 when calculating the geometric mean.
- Section 5.4.8: The department has added the seasonal disinfection requirements to reflect the changes in the disinfection rules.
- Section 5.4.9: The department has added the laboratory certification requirements for PFAS testing.
- Sections 5.5.14 to 5.5.16: The department has added sludge reporting requirements if the sludge was landfilled or hauled to another facility.
- Section on monitoring and calculation requirements for PCB Concentrations in Sludge has been removed as the permittee is not required to monitor for PCBs in the sludge this permit term.

6 Summary of Reports Due

A summary of reports due has been added for informational purposes for the permittee to keep track of the due dates of reports and schedule items.

Other Comments/Changes from Previous Permit

None.

Justification Of Any Waivers from Permit Application Requirements

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

Attachments

“Water Quality-Based Effluent Limitations for the Whitelaw Wastewater Treatment Facility WPDES Permit No. WI-0022047-11” memo dated September 28, 2026.

Monitoring Frequency Evaluation

Prepared By:

Trevor Moen
Wastewater Engineer
Bureau of Water Quality

Date: 10/27/2026
Post Fact Check Revision Date: 11/11/2026
Post Public Notice Revision Date:

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 09/28/2026

TO: Trevor Moen – NER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for the Whitelaw Wastewater Treatment Facility WPDES Permit No. WI-0022047-11

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable) for the discharge from the Whitelaw Wastewater Treatment facility (WWTF) in Manitowoc County. This municipal WWTF discharges to an unnamed tributary to Hempton Lake, located in the Branch River Watershed in the Lakeshore Basin. This discharge is included in the Northeast (NE) Lakeshore Total Maximum Daily Load (TMDL) as approved by EPA on 10/30/2023.

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	Footnotes
BOD_5			30 mg/L	20 mg/L	1
TSS TMDL			30 mg/L 26 lbs/day	20 mg/L 19 lbs/day	1,2
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		4.0 mg/L			1
Ammonia Nitrogen					1,3
Bacteria					4
E. coli				126 #/100 mL geometric mean	
Chloride					1,5
PFOS and PFOA					6
Phosphorus TMDL				1.0 mg/L 0.82 lbs/day	1,2
TKN, Nitrite+Nitrate, and Total Nitrogen					7
Chlorine	19 µg/L		7.3 µg/L	**7.3 µg/L**	8,9

Footnotes:

1. No changes from the current permit.
2. The Total Suspended Solids (TSS) and total phosphorus mass limits are based on the TMDL for the NE Lakeshore Basin TMDL to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA on 10/30/2023.
3. Monitoring only.
4. Bacteria limits apply during the disinfection season of May through September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL. A compliance schedule may be included in the reissued permit to meet the bacteria limits.

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5. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
6. PFOS and PFOA monitoring is recommended at a frequency of once every two months in accordance with s. NR 106.98(2), Wis. Adm. Code.
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 nitrite (NO_2), nitrate (NO_3), and total Kjeldahl nitrogen (TKN) (all expressed as N).
8. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
9. Chlorine limits would only be required if Whitelaw chooses to use chlorination for disinfection. 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 (2) – Narrative & Outfall Map

PREPARED BY: Nicole Krueger, Water Resources Engineer – SER

E-cc: Heidi Schmitt Marquez, Regional Wastewater Supervisor – NER
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3
AJ Jeninga-Nehls, Wastewater Specialist – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for Village of Whitelaw

WPDES Permit No. WI-0022047-11

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Whitelaw owns and operates an oxidation ditch WWTF designed for an annual average flow of 0.15 MGD that was constructed in 2001 and upgraded in 2024. The facility accepts trucked-in wastewater from domestic holding tank systems outside of the sewer service area and from the local licensed landfill. The treatment facilities include fine screening followed by biological treatment with two concentric aeration (reactor) tanks and a central clarifier with phosphorus chemical removal. Waste activated sludge is aerobically digested and then stored on-site until disposal. Sludge is disposed by land application to agricultural fields as a soil amendment and plant fertilizer.

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

Existing Permit Limitations

The current permit, which expired on 06/30/2026, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
BOD_5			30 mg/L	20 mg/L	1,2
TSS TMDL			30 mg/L 26 lbs/day	20 mg/L 19 lbs/day	1,2,3
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		4.0 mg/L			1,2
Ammonia Nitrogen					4
Chloride					4
Phosphorus TMDL				1.0 mg/L 0.82 lbs/day	3

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. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. The TSS and phosphorus mass limits are based on the TMDL for the NE Lakeshore Basin TMDL to address phosphorus water quality impairments within the TMDL area.
4. Monitoring only.

Receiving Water Information

- Name: Unnamed tributary to Hempton Lake
- Waterbody Identification Code (WBIC): 71750
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: LAL community from the outfall to Hempton Lake (approximately 1.5 miles), non-public water supply and recreational use. Hempton Lake is classified as a warmwater sport fish (WWSF) community. 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 estimates due to the noncontinuous nature of the stream, where Outfall 001 is located.
  7-Q_{10} = 0 cubic feet per second (cfs)
  7-Q_2 = 0 cfs
- Flow downstream at Hempton Lake: When considering downstream impacts at Hempton Lake in this memo, a ten-to-one dilution ratio will be used for calculating effluent limitations based on chronic or long-term impacts, in accordance with s. NR 106.06(4)(b)2, Wis. Adm. Code.
- Hardness = 400 mg/L as $CaCO_3$. This value represents the geometric mean of four effluent samples collected in March 2026 which were reported on the permit application. Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Source of background concentration data: Background concentrations are not included because they do not impact the calculated WQBEL when the receiving water low flows are equal to zero. Background ammonia concentrations for Hempton Lake for downstream protection are described in the ammonia section of this evaluation.
- Multiple dischargers: None.
- Impaired water status: The immediate receiving water or Hempton Lake are not 303(d) listed as impaired. The Branch River approximately 3 miles downstream from Whitelaw's outfall, is 303(d) listed as impaired for PCBs and total phosphorus.

Effluent Information

- Design flow rate:
  Annual average = 0.15 million gallons per day (MGD)
  For reference, the actual average flow from 07/01/2021 – 07/31/2026 was 0.108 MGD.
- Hardness = 400 mg/L as $CaCO_3$. This value represents the geometric mean of four samples collected in March 2026 which were reported on the permit application.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with zero industrial contributors.
- Water supply: Municipality waterworks and private wells.
- Additives: Whitelaw has included one additive in the permit application that has the potential to be present in Outfall 001. This additive is listed below:
  - Martelle Water Treatment: Neo Water FX 300 – 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 which is the case for this additive. 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)
03/02/2026	3.9	03/14/2026	6.3	03/26/2026	3.8
03/05/2026	6.2	03/17/2026	6.4	03/29/2026	4.7
03/08/2026	4.9	03/20/2026	7.0	04/01/2026	6.5
03/11/2026	4.8	03/23/2026	5.9		
1-day P_{99} = 8.6 µg/L					
4-day P_{99} = 6.9 µg/L					

The effluent chloride data below is from 12 samples during the permit term from 2023 as well as four samples that were reported on the permit reissuance application from 2026.

Chloride Effluent Data

	Chloride (mg/L)
1-day P_{99}	393
4-day P_{99}	334
30-day P_{99}	299
Mean	281
Std	42.3
Sample size	16
Range	211 - 373

The following table presents the average concentrations and loadings at Outfall 001 from 07/01/2021 – 07/31/2026 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameters with Effluent Limits

	Average Measurement	Average Mass Discharged
BOD_5	6.0 mg/L	
TSS	4.7 mg/L	4.54 lbs/day
Dissolved Oxygen	6.64 mg/L	
pH field	7.4 s.u.	
Phosphorus	0.49 mg/L	0.34 lbs/day

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-Q10

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Adm. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{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.

$$Limitation = \frac{(WQC) \times (Q_S + (1-f) \times Q_e) - (Q_S - fQ_e) \times (C_S)}{Q_e}$$

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 the case for Whitelaw.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.0	19.0				
Arsenic		340	340	68.0	0.43		
Cadmium	400	142	142	28.3	<0.3		
Chromium	301	4446	4446	889	<1.3		

Attachment #1

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.
Copper	400	57.4	57.4			8.6	7.0
Lead	356	365	365	72.9	<3.5		
Nickel	268	1080	1080	216	1.8		
Zinc	333	345	345	68.9	21		
Chloride (mg/L)		757	757			393	373

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.
* * Per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016 consideration of ambient concentrations and 1-Q_{10} flow rates yields a more restrictive limit than the 2 × ATC method of limit calculation.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)
RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.28	7.28			
Arsenic		152	152	30.4	0.43	
Cadmium	175	3.82	3.82	0.76	<0.3	
Chromium	301	326	326	65.2	<1.3	
Copper	400	33.9	33.9			6.9
Lead	356	95.5	95.5	19.1	<3.5	
Nickel	268	169	169	33.8	1.8	
Zinc	333	345	345	68.9	21	
Chloride (mg/L)		395	395			334

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

Monthly Average Limits based on Wildlife Criteria (WC)
The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)
RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HTC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	880	880	176	<0.3
Chromium (+3)	8400000	8400000	1680000	<1.3
Lead	2240	2240	448	<3.5
Nickel	110000	110000	22000	1.80

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 0 cfs

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	40	40.0	8.00	0.43

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

Conclusions and Recommendations
Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are not required for toxic substances in this section. Monitoring recommendations are made in the paragraphs below:

Chloride – Considering available effluent data from the current permit term (01/25/2023 – 03/11/2026), the 1-day P_{99} chloride concentration is 393 mg/L, and the 4-day P_{99} of effluent data is 334 mg/L.

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

Mercury – The permit application did not require monitoring for mercury because Whitelaw 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. All results in the sludge from 04/21/2022 – 02/11/2025 (n=4) were nondetect. Therefore, **no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Available monitoring sample data from Whitelaw Waterworks (PWS ID: 43604396) is provided in the table below:

Water Supply PFAS Data

Sample Date	Sample ID	Well #	PFOS (ng/L)	PFOA (ng/L)
06/06/2023	CB06138-02	BG250	<0.32	<0.5

The limited data above shows the municipal water supply is below 1/5th of the applicable PFOS and PFOA criteria. Based on available PFOS/PFOA sludge monitoring data (PFOS of 30.4 µg/kg and PFOA of 89.2 µg/kg), **PFOS and PFOA monitoring is recommended at a once every two months frequency.**

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

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

$$ATC\ in\frac{mg}{L} = \left[\frac{A}{(1+10^{7.204-pH})}\right] + \left[\frac{B}{(1+10^{(pH-7.204)})}\right]$$

Where:

A = 0.633 and B = 90.0 for Limited Aquatic Life, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1535 sample results were reported from 07/02/2021 – 07/31/2026. The maximum reported value was 8.2 s.u. (Standard pH Units). The effluent pH was 8.0 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 8.0 s.u. The mean plus the standard deviation multiplied by a factor of 2.326, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.0 s.u. Therefore, a value of 8.0 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.0 s.u. into the equation above yields an ATC = 13 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method
In accordance with s. NR 106.32(2), Wis. Adm. Code daily maximum ammonia limitations are calculated using the the 1-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	26
1-Q_{10}	13

The 1-Q_{10} method yields the most stringent limits for Whitelaw.

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 – LAL

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	83	7.0 < pH ≤ 7.1	51	8.0 < pH ≤ 8.1	11
6.1 < pH ≤ 6.2	82	7.1 < pH ≤ 7.2	46	8.1 < pH ≤ 8.2	8.8
6.2 < pH ≤ 6.3	80	7.2 < pH ≤ 7.3	40	8.2 < pH ≤ 8.3	7.3
6.3 < pH ≤ 6.4	78	7.3 < pH ≤ 7.4	35	8.3 < pH ≤ 8.4	6.0
6.4 < pH ≤ 6.5	75	7.4 < pH ≤ 7.5	31	8.4 < pH ≤ 8.5	5.0
6.5 < pH ≤ 6.6	72	7.5 < pH ≤ 7.6	26	8.5 < pH ≤ 8.6	4.1
6.6 < pH ≤ 6.7	69	7.6 < pH ≤ 7.7	22	8.6 < pH ≤ 8.7	3.4
6.7 < pH ≤ 6.8	65	7.7 < pH ≤ 7.8	19	8.7 < pH ≤ 8.8	2.8
6.8 < pH ≤ 6.9	60	7.8 < pH ≤ 7.9	16	8.8 < pH ≤ 8.9	2.4
6.9 < pH ≤ 7.0	56	7.9 < pH ≤ 8.0	13	8.9 < pH ≤ 9.0	2.0

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

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

Unnamed Tributary

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as Limited Aquatic Life is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 1.0,
$C = 8.09 \times 10^{(0.028 \times (25 - T))}$
T = the temperature of the receiving (ºC)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q_{10} (4-Q_3, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q_5 (estimated as 85% of the 7-Q_2 if the 30-Q_5 is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 ºC, 25% of the flow is used if the Temperature < 11 ºC, and 50% of the flow is used if the Temperature ≥ 11 ºC but < 16 ºC.

The "default" basin assumed values are used for Temperature, pH and background ammonia concentrations, because minimum ambient data is available. These values are shown in the table below, with the resulting criteria and effluent limitations.

Attachment #1

Weekly and Monthly Ammonia Nitrogen Limits – LAL

Unnamed tributary		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Effluent Flow	Qe (MGD)	0.5	0.5	0.5
Background Information	7-Q_{10} (cfs)	0	0	0
	7-Q_2 (cfs)	0	0	0
	Ammonia (mg/L)	0.04	0.05	0.105
	Average Temperature (°C)	15	19	7.0
	Maximum Temperature (°C)	15	21	13
	pH (s.u.)	8.06	8.08	7.99
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	0	0	0
	Reference Monthly Flow (cfs)	0	0	0
Criteria mg/L	4-day Chronic	35	24	45
	30-day Chronic	14	9.6	18
Effluent Limits mg/L	Weekly Average	35	24	45
	Monthly Average	14	9.6	18

Hempton Lake

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as a Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 0.854,
C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or
C = $1.45 \times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and
T = the temperature (ºC) of the receiving water – (Early Life Stages Present), or
T = the maximum of the actual temperature (ºC) and 7 - (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used to derive weekly average limitations, and the 30-day criteria are used to derive monthly average limitations, both by a mass-balance using a ten-to-one dilution ratio.

The "default" basin assumed values are used for Temperature, pH and background ammonia concentrations, because minimum ambient data is available. These values are shown in the table below, with the resulting criteria and effluent limitations.

Weekly and Monthly Ammonia Nitrogen Limits – WWSF

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Effluent Flow	Qe (MGD)	0.5	0.5	0.5
Background	Ammonia (mg/L)	0.04	0.05	0.105

Attachment #1

		Spring	Summer	Winter
		April & May	June – Sept.	Oct. - March
Information	Average Temperature (°C)	12	19	4
	Maximum Temperature (°C)	14	21	10
	pH (s.u.)	8.06	8.08	7.99
	Dilution factor	10	10	10
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	5.57	3.66	
	Early Life Stages Absent			8.26
	30-day Chronic			
	Early Life Stages Present	2.23	1.46	
	Early Life Stages Absent			3.30
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	60.9	39.8	
	Early Life Stages Absent			89.8
	Monthly Average			
	Early Life Stages Present	24.1	15.6	
	Early Life Stages Absent			35.3

Ammonia Decay

The Department must establish limits to protect downstream uses, according to s. NR 106.32(1)(b), Wis. Adm. Code. Ammonia decay may be considered when determining limits at the outfall to protect the downstream classification, according to s. NR 106.32(4)(c), Wis. Adm. Code. Where the calculated limits are more restrictive based on downstream uses, ammonia decay can be considered to determine if these more restrictive limits are needed or if the ammonia will decay before it reaches the point of the classification change.

Ammonia decay rates are dependent on temperature with in-stream nitrification essentially non-existent in the winter. In-stream decay is expected so a first order decay model should be used. Based on the available literature, a decay rate of 0.25 day^{-1} at 20°C has been suggested as a default rate. A temperature correction factor of q = 1.08 is ($k_{.t} = k_{20}\, q^{(T-20)}$). The ammonia nitrogen decay equation is provided below.

$$N_{\text{Limit}} = \left(\frac{N_{\text{down}}}{\text{EXP}(-k_t T)}\right)$$

Where:

N_{Limit}: = Ammonia limit needed to protect downstream use (mg/L)
N_{down}: = Ammonia limit calculated based on downstream classification and flow)mg/L)
$-k_t$ = Ammonia decay rate at background stream temperature (day^{-1})
T = Travel time from outfall to downstream use (day)

The velocity of receiving water is assumed to be 5 miles per day and the distance from the point of discharge to the classification change is approximately 1.5 miles for a travel time of 0.3 days. This equation shows that at the location where the classification change, 93-97% of the ammonia is remaining, depending on the season. After decay, the limits are increased as shown in the following table.

Attachment #1

Ammonia Nitrogen Decay Limits Comparison

	LAL		WWSF		After decay		Most stringent	
Months Applicable	Weekly Average mg/L	Monthly Average mg/L	Weekly Average mg/L	Monthly Average mg/L	Weekly Average mg/L	Monthly Average mg/L	Weekly Average mg/L	Monthly Average mg/L
April – May	35	14	61	24	64	25	35	14
June – Sept	24	9.6	40	16	43	17	24	9.6
Oct – March	45	18	90	35	93	36	45	18

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from 07/02/2021 – 07/31/2026.

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April – May**	June - September	October - March
1-day P_{99}		4.09	6.60
4-day P_{99}		2.17	3.52
30-day P_{99}		0.90	1.46
Mean*	0.075	0.28	0.49
Std	1.00	1.61	2.41
Sample size	44	91	134
Range	<0.1 - 2.6	<0.1 - 7.2	<0.1 - 8.4

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

**There are less than 11 detected samples for April – May, so P_{99}'s cannot be calculated

Reasonable Potential

The need to include ammonia limits in Whitelaw's permit is determined by calculating 99th upper percentile (or P_{99}) values for ammonia year-round and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. **No limits are needed; however, monitoring is recommended to continue.**

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

Whitelaw had previously been exempted from disinfection based on the LAL or limited forage fish community classification of the receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis.

Adm. Code (**not** on the water quality classifications - i.e., limited forage fish, limited aquatic life - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for the unnamed tributary to Hempton Lake is listed in ch. NR 104, Wis. Adm. Code, as continuous. Continuous streams have a higher likelihood of providing opportunities for full contact recreational activities. Therefore, disinfection should not be exempted based solely on this hydrological classification.

The Department has considered the information required by s. NR 210.06(3), Wis. Adm. Code, and has determined that the discharge cannot meet bacteria limits without disinfection. Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

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

These limits are required during May through September. The permit will include a compliance schedule to meet these limits.

Total Residual Chlorine – **If Whitelaw decides to upgrade to use chlorination for disinfection, effluent limitations would be recommended to assure proper operation of the de-chlorination system.** Section NR 210.06(2)(b), Wis. Adm. Code, states, "When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L." Because the WQBELs are more restrictive, they are recommended instead. Specifically, **a daily maximum limit of 19 µg/L would be required if Whitelaw decides to use chlorination for disinfection.** Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. The calculated **weekly average effluent limitation of 7.3 µg/L would also be included in the permit because it is more restrictive than the daily maximum limit.**

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

PART 5 – PHOSPHORUS

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

Since Whitelaw currently has a limit of 1.0 mg/L, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

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

Total Suspended Solids in the Northeast Lakeshore Region report are expressed as maximum annual loads (lbs/year). The TP WLA for Whitelaw is 157 lbs/year. The following table summarizes Whitelaw's annual loading from the current permit term:

Annual TP Loading

Year	TP (lbs/year)
2022	218
2023	212
2024	137
2025	117
2026*	72.8

*The data for 2026 is only from Jan-July 2026.

The TMDL-based limits became effective October 2024. Because Whitelaw has been meeting the annual WLA of 157 lbs/year since the limits became effective, the **current TMDL-based limit of 0.82 lbs/day as a monthly average is recommended to continue in the reissued permit.** This limit was previously calculated using a multiplication factor based on effluent variability and monitoring frequency.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from 07/05/2021 – 07/29/2026.

Total Phosphorus Effluent Data

	Phosphorus (mg/L)
1-day P_{99}	1.81
4-day P_{99}	1.05
30-day P_{99}	0.66
Mean	0.49
Std	0.36
Sample size	265
Range	0.044 - 2.5

PART 6 – TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*April 2020). This WLA found in Appendix L of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Northeast Lakeshore Region* report are expressed as maximum annual loads (lbs/year). The TSS WLA for Whitelaw is 4,841 lbs/year. The following table summarizes Whitelaw's annual loading from the current permit term:

Annual TSS Loading

Year	TSS (lbs/year)
2022	1549
2023	1557

Attachment #1

Year	TSS (lbs/year)
2024	1555
2025	1521
2026*	868

*The data for 2026 is only from Jan-July 2026.

Because Whitelaw is already meeting the annual WLA of 4,841 lbs/year, the **current TMDL-based limits of 26 lbs/day as a weekly average and 19 lbs/day as a monthly average are recommended to continue in the reissued permit.** These limits were previously calculated using multiplication factors based on effluent variability and monitoring frequency.

Effluent Data

The following table summarizes effluent total suspended solids monitoring data from 07/05/2021 – 07/29/2026.

Total Suspended Solids Effluent Data

	TSS (mg/L)	TSS (lbs/day)
1-day P_{99}	8.17	11.2
4-day P_{99}	6.29	7.47
30-day P_{99}	5.27	5.56
Mean	4.75	4.64
Std	1.19	2.02
Sample size	530	530
Range	1.8 - 9.1	1.23 – 20.9

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

Reasonable Potential

Based on the available discharge temperature data from 01/01/2011 – 06/30/2016, shown below, the maximum daily effluent temperature reported was 74°F; therefore, no reasonable potential for exceeding the daily maximum limit exists, and **no limits or monitoring are recommended**.

Attachment #1

Monthly Temperature Effluent Data & Limits

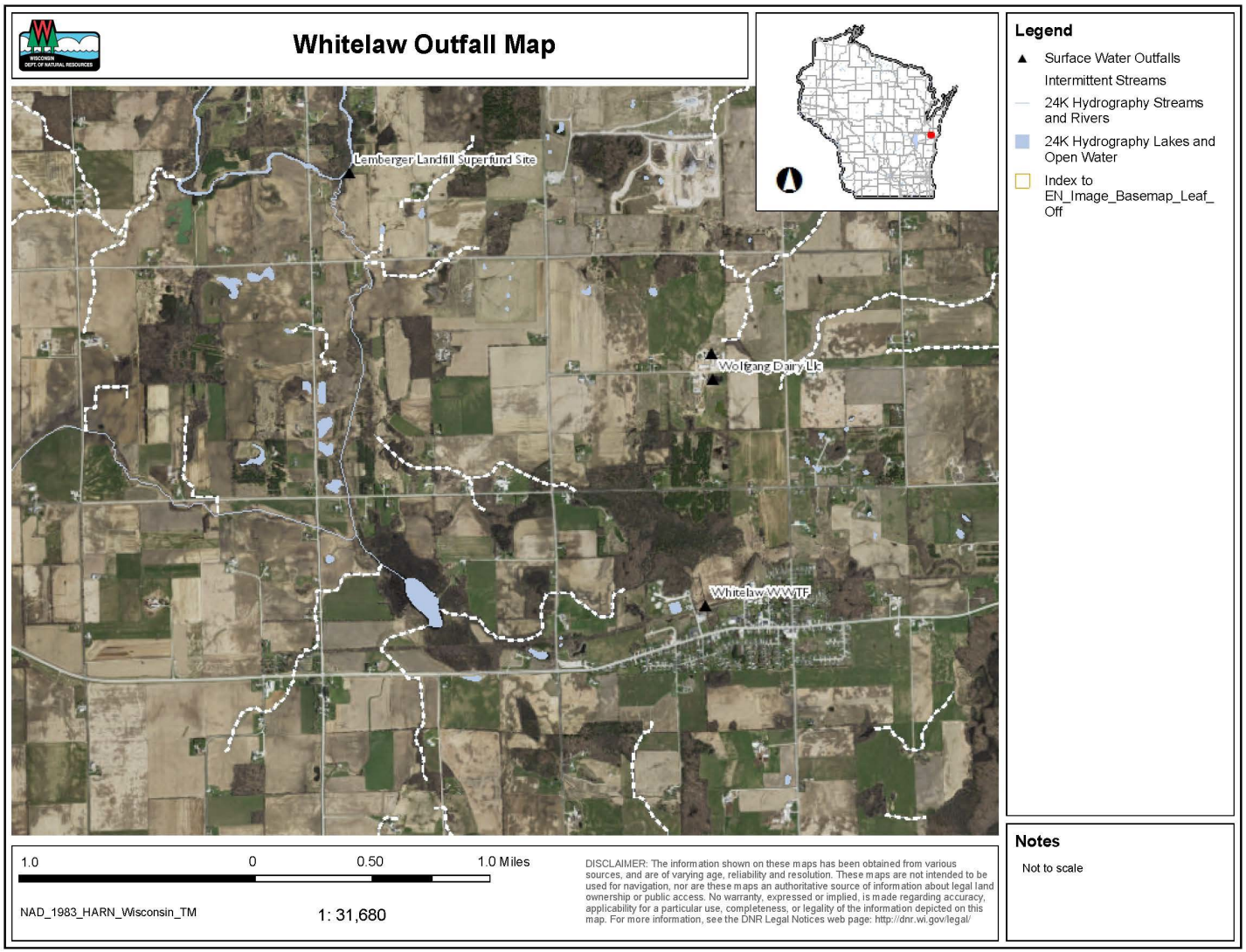
Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	49	51	-	86
FEB	47	49	-	86
MAR	54	55	-	86
APR	54	56	-	86
MAY	61	64	-	86
JUN	67	68	-	86
JUL	73	74	-	86
AUG	71	72	-	86
SEP	70	72	-	86
OCT	66	67	-	86
NOV	60	62	-	86
DEC	53	55	-	86

PART 8 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document* (2022).

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. Whitelaw has developed a standard operating procedure for the phosphorus removal chemical to avoid overdosing. **No WET testing is recommended at this time because of the low risk in effluent toxicity.**

Attachment #2



Monitoring Frequency Evaluation

This monitoring frequency evaluation is for the Village of Whitelaw Wastewater Treatment Facility (WWTF) as part of the reissuance of WPDES Permit No. WI-0022047-11-0. The criteria to assess this evaluation were taken from the *Monitoring Frequencies for Individual Wastewater Permits* guidance dated April 12, 2021. The standard monitoring frequencies recommended in this guidance are intended to apply in most situations. Whitelaw WWTF is currently at the minimum frequency for total BOD_5, total suspended solids (TSS), and pH. However, there may be cases where site-specific conditions justify other monitoring frequencies. When establishing a monitoring frequency for an individual discharge, department should consider factors that may necessitate more frequent or less frequent monitoring. Factors that should be considered when establishing the other monitoring frequencies include the following:

Treatment Facility Design Flow and Organic Capacity:

The Whitelaw WWTF has an annual average design flow rate of 0.150 million gallons per day and design BOD load of 210 lbs/day. Whitelaw WWTF has consistently had low grades (D or F) in the past 5 years for the influent flow and organic loading section of Compliance Maintenance Annual Report (CMAR). Results on the CMAR demonstrate that Whitelaw WWTF is operating above their design capacity for flow and organic loading (BOD).

Type of Treatment Processes Used at the Facility:

Whitelaw WWTF consists of an activated sludge treatment system. Preliminary treatment consists of influent pumping and fine screening. Secondary treatment processes include activated sludge treatment with an oxidation ditch with two channels, chemical phosphorus removal with Neo Water FX 300, and secondary clarification. The final treated effluent then flows by gravity through to the outfall structure to the Unnamed Tributary to Hempton Lake via Outfall 001.

The minimum monitoring frequencies in the current permit are similar to other municipal WWTFs with similar treatment processes and design flows.

Facility Compliance History:

Criminal Actions (all environmental statutes)

- Whitelaw WWTF was not criminally convicted under Federal or State environmental statutes of falsifying monitoring data or committing violations that presented an imminent and substantial endangerment of public health or welfare.
- Whitelaw WWTF was not convicted of any other criminal violation under any Federal or State environmental statute.
- No individual, while employed by Whitelaw WWTF, was convicted of a criminal violation under any Federal or State environmental law.

Civil Judicial Actions (Clean Water Act/WPDES related)

No civil judicial action with respect to the Clean Water Act and Whitelaw WWTF's current WPDES permit occurred in the last year.

Administrative Actions (Clean Water Act/WPDES related)

No Administrative Penalty Order (APO) or Administrative Order (AO) is currently in effect or will be in effect when the Whitelaw WWTF's permit is reissued.

Parameter-by-Parameter Compliance History:

Significant Noncompliance for parameters under Consideration

- Whitelaw WWTF has not had any Significant Noncompliance (SNC) for the parameters for which minimum monitoring/reporting are being considered during the last two years.

Any Effluent Violations of Selected Parameters

- Whitelaw WWTF has not had any effluent violations of selected (critical) parameters during the last year. These selected parameters include pollutants which pose heightened risks to human or environmental

health, such as ammonia.

For more information, the department can provide the inspection report dated May 26, 2026, that shows that Whitelaw WWTF had demonstrated compliance with effluent limits in the current permit.

Type of Wastewater Treated:

Whitelaw WWTF treats mostly domestic and commercial wastewater from the sanitary sewer collection system in the Village sewer service area and domestic septage from holding tanks serviced in the area and surrounding townships accepted at the septage receiving station.

Number of Samples Needed to Determine Compliance with Effluent Limitations

The monitoring frequencies proposed in the permit would provide an adequate number of samples to determine compliance with the effluent limitations in the permit.

Nature of Pollutants:

The minimum monitoring frequencies proposed would accurately characterize the concentration of the pollutants for Whitelaw WWTF. Whitelaw WWTF mostly treats domestic and commercial wastewater and there is very little variable in the pollutant loadings to the wastewater treatment facility. Also, the department has confirmed that the sample point locations are collecting representative samples of the wastewater influent and effluent.

Frequency of the Discharge:

Whitelaw WWTF is a continuous discharger. The minimum monitoring frequencies proposed would be applicable for a continuous discharger.

Number of Samples Needed to Calculate Water Quality Based Effluent Limitations (WQBELs):

The minimum monitoring frequencies proposed would provide adequate number of sample results to properly determine reasonable potential when developing WQBELs for the next permit reissuance.

Seasonal or Monthly Limits:

The monitoring frequencies proposed in the permit would provide an adequate number of samples to determine compliance with the monthly average limits proposed in the permit.

Conclusion:

Based on the information for the factors listed, the minimum monitoring frequencies for total BOD_5 and TSS based on the guidance, except for pH, shall remain the same for Whitelaw WWTF. Given that the facility adds Neo-Water FX 300 daily which impacts the effluent pH, the department believes the standard monitoring frequency of daily is necessary for effluent pH field. Facilities should maintain excellent performance levels to continue to receive monitoring frequency reductions in future permit terms.