Permit Fact Sheet

General Information

Permit Number	WI-0060895-11-0
Permittee Name and Address	Village of White Lake P O Box 8 615 School Street, White Lake, WI 54491
Permitted Facility Name and Address	Village of White Lake W2099 Erdman Road, White Lake, Wisconsin
Permit Term	January 01, 2027 to December 31, 2031
Discharge Location	Erdman Road, White Lake, Wisconsin (NW¼ - NW¼ of section 27; T31N-R14E)
Receiving Water	The Groundwater of the Wolf River/Langlade and Evergreen Rivers Watershed in the Wolf River Drainage Basin in Langlade County
Discharge Type	Existing seasonal
Annual Average Design Flow (MGD)	0.05 MGD
Industrial or Commercial Contributors	None
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of White Lake owns and operates a wastewater treatment system. The plant is designed to treat 50,000 gallons per day currently treats an average of 33,000 gallons per day (June 2021 - June, 2026 data). The system consists of one clay-lined, five-acre stabilization pond containing naturally occurring bacteria already in the wastewater that metabolize organic matter. Effluent is discharged to two seepage cells (each 0.45 acres). The sandy soil in the bottom of the seepage cells continues to treat the effluent as it eventually reaches groundwater. There are 5 monitoring wells and 2 piezometers (no longer in service) located around the seepage cells to assess any groundwater impacts of the discharge.

Substantial Compliance Determination

All conditions and standard requirements of the current permit have been met.

After a desk top review of all discharge monitoring reports, CMARs, land app reports, and a virtual inspection conducted on 5/19/2026 by Brooke Klingbeil, the Village of White Lake WWTF has been found to be in substantial compliance with their current 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	**INFLUENT** An average of 0.033 MGD (June 2021 – June 2026 data)	Representative grab samples shall be collected from the wet well of lift station #3.
001	**EFFLUENT** An average of 0.053 MGD on days of discharge. Discharges occur on about 220 days per year during the summer and fall. (June 2021 – June 2026 data)	Representative grab samples shall be collected from the dual chamber control structure located in the eastern levee of the stabilization pond.
002	**SLUDGE** Sludge has never been removed.	Representative samples shall be collected from the accumulated sludge in the pond at various locations and depths that are combined for analysis.

Sample Point Designation For Groundwater Monitoring Systems	
Well Number and Name	**Comments**
MW 801 (MW1-Background)	Upgradient well used to measure background groundwater quality and to evaluate and calculate PALs and ACLs. It is located about 300’ north of the facility along the access road.
MW 802 (MW2-NE)	Down gradient point of standard well located about 250’ east of seepage cell #1.
MW 803 (MW3-SE)	Down gradient non-point of standard well located less than 150’ southeast of seepage cell #2.
MW 804 (MW-4)	Down gradient point of standard well located about 300’ southeast of seepage cell #2.
MW 806 (MW-5)	Down gradient point of standard well located over 300’ east of the southeast corner of seepage cell #2.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD5, Total		mg/L	2/Month	Grab	
Suspended Solids, Total		mg/L	2/Month	Grab	
Nitrogen, Organic Total		mg/L	Quarterly	Calculated	Organic Nitrogen = Total Kjeldahl Nitrogen (mg/L) - Ammonia Nitrogen (mg/L)
Nitrogen, Total Kjeldahl		mg/L	Quarterly	Grab	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Quarterly	Grab	

Changes from Previous Permit:

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

BOD and **Total Suspended Solids** monitoring frequency was changed to match effluent montoring.

Explanation of Limits and Monitoring Requirements

Influent monitoring is needed to assess loading to the facility and treatment performance. The required parameters and sampling frequency are appropriate for a land treatment system as outlined in ch NR 206, Wis. Adm. Code.

2 Land Treatment – Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Monthly Avg	50 mg/L	Monthly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	Grab	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	Organic Nitrogen = Total Kjeldahl Nitrogen (mg/L) - Ammonia Nitrogen (mg/L)
Nitrogen, Nitrite +		mg/L	Monthly	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrate Total					
Nitrogen, Total		mg/L	Monthly	Calculated	Total Nitrogen = Total Kjeldahl Nitrogen (mg/L) + (Nitrate + Nitrite) Nitrogen (mg/L)
Chloride		mg/L	Annual	Grab	

Changes from Previous Permit:

Effluent limitations and monitoring requirements were evaluated for this permit term and no changes were required in this permit section.

Explanation of Limits and Monitoring Requirements

All requirements for land treatment of municipal wastewater are determined in accordance with ch. NR 206, Wis. Adm. Code. All categorical limits are based on s. NR 206.08**(1)** Wis. Adm. Code. More information on the limitations can be found in the "Groundwater Evaluation for Village of White Lake, WI-0060895" memo dated July 27, 2026.

3 Groundwater – Monitoring and Limitations

Groundwater Monitoring System for Seepage Cells Groundwater Monitoring System

Location of Monitoring system: Adjacent to Seepage Cells

Groundwater Monitoring Well(s) to be Sampled: MW 801 (MW1-Background), MW 802 (MW2-NE), MW 803 (MW3-SE), MW 804 (MW-4), MW 806 (MW-5)

Groundwater Monitoring Well(s) Used to Evaluate Background Groundwater Quality: MW 801 (MW1-Background)

Groundwater Monitoring Well(s) Used for Point of Standards Application: MW 802 (MW2-NE), MW 804 (MW-4), MW 806 (MW-5)

Parameter	**Units**	**Preventative Action Limit**	**Enforcement Standard**	**Frequency**
Depth To Groundwater	feet	N/A	N/A	Quarterly
Groundwater Elevation	feet MSL	N/A	N/A	Quarterly
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	2.7	10	Quarterly
Chloride Dissolved	mg/L	125	250	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	Quarterly
Nitrogen, Organic Dissolved	mg/L	2.4	N/A	Quarterly
Solids, Total Dissolved	mg/L	490	N/A	Quarterly

Nitrogen, Total	mg/L	N/A	N/A	Quarterly

Changes from Previous Permit:

Groundwater 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.

- **Parameter monitoring** shall occur quarterly this permit term instead of twice a year.
- The PALs have been updated for **Dissolved Nitrite + Nitrate Nitrogen** (4.5 mg/L to 2.7 mg/L) and **Dissolved Organic Nitrogen** (2.2 mg/L to 2.4 mg/L)

Explanation of Limits and Monitoring Requirements

Groundwater limits and requirements are determined in accordance with ch. NR 140, Wis. Adm. Code. Indicator parameter Preventive Action Limit (PAL) values are established per s. NR 140.20, Wis. Adm. Code. Alternative Concentration Limits as allowed under s. NR 140.28, Wis. Adm. Code, are established on a case-by-case basis.

For more information, please refer to the "Groundwater Evaluation for Village of White Lake, WI-0060895" memo dated July 27, 2026.

4 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	Sludge has never been removed and is not anticipated this permit term. If removal is needed see the land application and schedule sections of the permit for more information.			
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, the most recent result (2020) is 0.52 pCi/liter is well below the threshold. If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in land applying 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.						

4.1 Sample Point Number: 002- Lagoon Sludge

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Once	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Per Application	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Per Application	Composite	
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	See the Sludge Analysis for PCBs permit section.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	See the Sludge Analysis for PCBs permit section.
PFOA + PFOS		ug/kg	Once	Calculated	Monitor for PFOA + PFOS between 01/01/2027 - 06/30/2027 to meet the

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					requirements of PFAS General Permit (WI-0012345-0). Report the sum of PFOA and PFOS. See PFAS permit sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

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.

- **List 1** (Metals), **PCBs** and **PFAS** monitoring is required during the second year of the permit term (2028).
- Because it's recommended that **List 2** (Nutrients) are monitored with List 1 monitoring, they have been added to the table.
- Due to changes within the **land application forms**, the 3400-049 ("Characteristics Report"), 3400-052 ("Other Methods of Disposal") and 3400-055 (Annual Land Application") will need to be submitted each year.
- Monitoring for **PFAS** is required pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code. To maintain compliance with General Permit, WI-0012345-0, "PFAS Monitoring for Sewage Sludge (Biosolids) Generators" language has been added to the permit to restate that monitoring for PFOA+PFOS is required by June 30, 2027. If the PFOA+PFOS result is under 20 ug/kg General Permit, WI-0012345-0, "PFAS Monitoring for Sewage Sludge (Biosolids) Generators" will be discontinued. If the results are over 20 ug/kg, General Permit section 5.4 must be followed (See link https://dnr.wisconsin.gov/sites/default/files/topic/Wastewater/PFASMonitoringforSewageSludgeGenerators-GeneralPermit.pdf). Based on the requirements of this section the Individual Permit WI-0029033-12-0 for the City of Park Falls may be modified to include additional sludge PFAS conditions.

Explanation of Limits and Monitoring Requirements

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

List 2 Nutrient monitoring – Monitoring for list 2 (nutrients) is highly recommended at the same time as the monitoring of list 1 (metals) in year 2 of the permit (2028). Results will assist in the determination of the acres needed for land application of sludge should it be necessary. The number of acres needed is also required for the Sludge Management Schedule (see schedules for more information).

Change in form submittal – In prior permit reissuances when it has been noted in the application that sludge would not be removed during the permit term, the department required sampling during the second year of the permit term and the

sludge characteristic report (3400-049) would be generated only during that year. Due to moving to electronic submittal of forms via Switchboard, forms 3400-049 ("Characteristics Report"), 3400-052 ("Other Methods of Disposal") and 3400-055 ("Annual Land Application") will now be generated by the department and the permittee will be required to submit all three reports each year of the permit term. This change was adopted to provide the permittee flexibility because many lagoon desludging projects can be unexpected, are delayed or staggered over multiple years. Additionally, it is used to officially report that no land application of sludge has occurred, and annual submittal of the forms is required per the standard requirements section.

- Sludge analysis during the second year of the permit term has been included. There are check boxes available on the electronic forms to identify if desludging didn't occur.
- Sludge characteristics report (3400-049) – at the top of the form check "yes" or "no" in the box identifying if any land application occurred that year. Complete the form if required or identify the year samples will be or have been taken in the comments section.
- 3400-052 ("Other Methods of Disposal") and 3400-055 ("Annual Land Application") - The reports are technically 2 separate forms that are now combined in one location but separated onto two different tabs. If you answer "No" to both listed questions the forms are complete. If you need to answer "Yes" to either question the corresponding form tabs will go from gray to blue indicting information can be entered on the report.

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

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

5 Schedules

5.1 Land Treatment Optimization

Required Action	Due Date
Land Treatment Management Plan Submittal: Submit an update to the management plan to optimize the land treatment system performance and demonstrate compliance with ch. NR 206, Wis. Adm. Code. The land treatment system shall be operated in accordance with the approved management plan.	03/31/2027
Loading and Resting Records: Review and update the facility loading and resting logs. The logs should identify which cell is being loaded and include the start and end date/time for loading, the loaded volume and date/time for when the cells go dry (dry meaning there is no longer visible standing water on the base of the cell). These logs shall be made available to the department upon request. Keep accurate information on the absorption cell loading during a normal operation.	04/01/2027
Load Rest Cycles: Look for trends in the data and submit a report on potential adjustments of the load rest cycles to increase nitrification/denitrification. Increase rest periods incrementally allowing time for equilibration.	06/30/2028
Optimization Update: Submit a report on the adjustments implemented over the previous year, any changes in nitrification/denitrification and additional adjustments that will be implemented in the next year.	06/30/2029

Final Land Treatment Management Plan: Submit a final report on adjustments implemented to the load rest cycles and summary of changes to nitrification/denitrification. Submit a management plan incorporating changes made to optimize the land treatment system performance and demonstrate compliance with ch. NR 206, Wis. Adm. Code. The land treatment system shall be operated in accordance with the approved management plan.	06/30/2030

Explanation of Schedule

Land Treatment Optimization – There were ACL exceedances of nitrite + nitrate in wells 802 and 806. The ACL exceedance requires a response action per s. NR 140.24, Wis. Adm. Code. At the end of the schedule an up-to-date Land Treatment Management plan is required per ch. NR 206, Wis. Adm. Code.

5.2 Annual Sludge Mapping

Required Action	Due Date
Map Sludge Depth: Sludge depth measurements should be taken across the pond. A map showing the sludge profile shall be prepared and submitted.	12/31/2027
Map Sludge Depth: Sludge depth measurements should be taken across the pond. A map showing the sludge profile shall be prepared and submitted.	12/31/2028
Map Sludge Depth: Sludge depth measurements should be taken across the pond. A map showing the sludge profile shall be prepared and submitted.	12/31/2029
Map Sludge Depth: Sludge depth measurements should be taken across the pond. A map showing the sludge profile shall be prepared and submitted.	12/31/2030
Map Sludge Depth: Sludge depth measurements should be taken across the pond. A map showing the sludge profile shall be prepared and submitted.	12/31/2031

Explanation of Schedule

Annual Sludge Mapping – The depth and distribution of the sludge in the ponds is not currently known. This information is important to determine the effectiveness of the ponds and estimate when sludge removal is needed.

5.3 Sludge Management Plan

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

desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed. The plan is due at least 60 days prior to desludging.	

Explanation of Schedule

Sludge Management Plan (municipal facility with a lagoon)- If the lagoons are to be de-sludged during this permit term a management plan is needed to show compliance with ch. NR 204, Wis. Adm. Code. There are outlines available to assist in plan development.

Attachments

Water Flow Schematic developed in 2016
"Groundwater Evaluation for Village of White Lake, WI-0060895" memo dated July 27, 2026

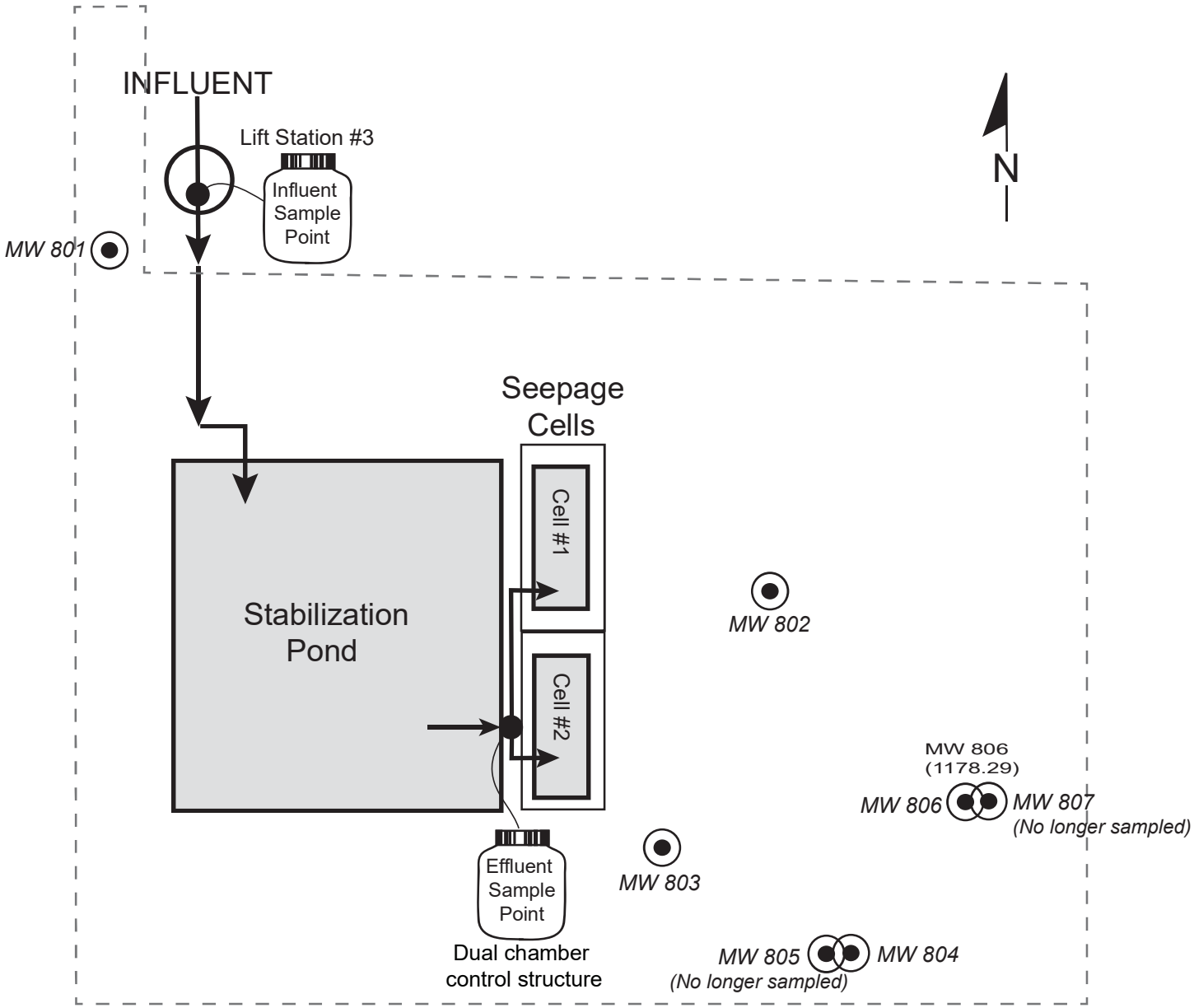
Justification Of Any Waivers From Permit Application Requirements

No waivers requested or granted as part of this permit reissuance

Prepared By: Sheri A. Snowbank Wastewater Specialist **Date:** August 21, 2026

VILLAGE OF WHITE LAKE
Wastewater Treatment Plant

The White Lake Sanitary District wastewater treatment facility consists of a clay-lined, five acre stabilization pond and two seepage cells of 0.45 acres each. The treatment system is operated to store wastewater from late fall to early spring and is alternately discharged to seepage cells to rest and load the cells. The flow diagram below shows the treatment units and sampling locations.



Monitoring Wells
Represents sample locations
Property Boundary

Flow: 0.05 MGD
BOD: 83 lb/day
Construction year: 1975

NOT TO SCALE

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: July 27, 2026

TO: File

FROM: Woody Myers - WCR

SUBJECT: Groundwater Evaluation for Village of White Lake, WI-0060895

Site Information

The White Lake Wastewater Treatment Facility, a municipal facility located at W2099 Erdman Road, White Lake, Langlade County. Wastewater is currently treated via a stabilization pond and discharged groundwater via infiltration by way of absorption ponds (seepage cells) located in the NW ¼ of the NW ¼ of Section 27, T31N, R14E, Town of Wolf River.

Land Disposal Effluent & Groundwater Evaluation Summary

Table 1 Land Disposal Outfall Sampling Point Parameters and Limits
Outfall 001 Absorption Ponds

Parameter	Current Permit WI-0060895-10		Proposed Permit WI-0060895-11	
	Limits and Units	Limit Type	Limits and Units	Limit Type
Flow Rate	- MGD		- MGD	
BOD_5	50 mg/l	Monthly Avg	50 mg/l	Monthly Avg
Nitrogen, Total Kjeldahl	- mg/l		- mg/l	
Nitrogen. Ammonia	- mg/l		- mg/l	
Nitrogen, Organic	- mg/l		- mg/l	
Nitrogen, Nitrite + Nitrate	- mg/l		- mg/l	
Nitrogen, Total	- mg/l		- mg/l	
Chloride	- mg/l		- mg/l	

No proposed permit changes

Table 2 Monitoring Wells

Well	Current Permit WI-0060895-10		Proposed Permit WI-0060895-11	
	Well Location	Well Designation	Well Location	Well Designation
801 (MW1)	Up-gradient	Background	Up-gradient	Background
802 (MW2)	Down-gradient	Point of Standard	Down-gradient	Point of Standard
803 (MW3)	Side-gradient	Non-Point of Standard	Side-gradient	Non-Point of Standard
804 (MW4)	Down-gradient	Point of Standard	Down-gradient	Point of Standard
806 (MW5)	Down-gradient	Point of Standard	Down-gradient	Point of Standard

No proposed permit changes

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Table 3 Groundwater Quality Standards

Parameter	Current Permit WI-0060895-10		Proposed WI-0060895-11	
	PAL	ES	PAL	ES
Depth to Groundwater	N/A	N/A	N/A	N/A
Groundwater Elevation	N/A	N/A	N/A	N/A
Nitrogen, Nitrite + Nitrate	4.5 mg/l (ACL)	10.0 mg/l	***2.7 mg/l (ACL)**	10.0 mg/l
Chloride	125 mg/l	250 mg/l	125 mg/l	250 mg/l
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	0.97 mg/l	9.7 mg/l
Nitrogen, Organic	2.2 mg/l	N/A	***2.4 mg/l**	N/A
Total Dissolved Solids	490 mg/l	N/A	490 mg/l	N/A
Nitrogen, Total	N/A	N/A	N/A	N/A

* Proposed permit changes

Geology

The bedrock under the facility is part of the Wolf River batholith. The Wolf River is comprised of the granitic and syenitic intrusive igneous rock. The rock is comprised of Rapakivi-textured quartz monzonite (*Bedrock Geology of Wisconsin, Regional Map Series Northeast Sheet*, Wisconsin Geological and Natural History Survey (WGNHS), 1984). Bedrock is anticipated to be greater than 100 feet below ground surface (bgs) (*Depth to Bedrock in Wisconsin,* WGNHS, 1973). The regolith consists of material of coarse sand with occasional observances of gravel and cobbles. Surface soil primarily consists of the Antigo silt loam (USDA Web Soil Survey).

Hydrogeology

Calculated groundwater elevation ranges between 1114 and 1135 feet above mean sea level (msl). Depth to groundwater was reported to be between 54 and 63 feet bgs. Groundwater flow direction was calculated to be to the southeast. Regional groundwater is to the southeast in this area of Langlade County (Altitude of water table in Langlade County, summer 1983 WGNHS). The Wolf River is approximately 2,600 feet east of the facility. There are two wells (municipal, other than municipal, private and high-capacity) within a 1,500-foot range of this facility's groundwater discharge.

Land Disposal Effluent Quality and Loading Rates

The following table is the average flow (hydraulic loading), total nitrogen, chloride and BOD_5 loading summations for the land disposal system.

Table 5 Land Treatment Disposal Loading Averages

Year	Flow (MGD)	Nitrogen (mg/l)	Chloride (mg/l)	BOD5 (mg/l)
2025	0.051	12.71	79	25.8
2024	0.056	10.13	75	18.7
2023	0.052	11.01	78	17.2
2022	0.058	6.22	75	16.0
2021	0.056	8.82	76	13.8

Groundwater Monitoring System and Sampling Frequency

All parameters are analyzed for the dissolved phase in groundwater. Established groundwater quality standards are found in Table 1 Public Health Groundwater Quality Standards s. NR 140.10, Wis. Adm. Code, and Table 2 Public Welfare Groundwater Standards s. NR 140.12, Wis. Adm. Code. The thresholds of these standards are the Enforcement Standard (ES) and the Preventative Action Limit (PAL).

Table 6 Groundwater Monitoring Well Data

Sample Point	Well Name	Elevation (feet above msl)				Length (feet)		Well Type
		Casing Top	Ground Surface	Screen Top	Screen Bottom	Screen Length	Well Depth	
801	MW1	1188.59	1185.5	1135.0	1125.0	10.0	62.6	WT
802	MW2	1182.50	1180.0	1122.0	1112.0	10.0	70.1	WT
803	MW3	1176.94	1174.2	1122.2	1112.2	10.0	64.2	WT
804	MW4	1169.36	1166.0	1116.0	1106.0	10.0	60.0	WT
806	MW5	1178.29	1176.2	1117.2	1107.2	10.0	69.0	WT

All measurements in feet
WT-Water table Observation P-Piezometer O-Other

Groundwater sampling results from this facility have been analyzed for each well to evaluate trends of the regulated compounds in groundwater and to calculate PALs for s. NR 140.22, Wis. Adm. Code Indicator Parameters and to evaluate potential exemptions under s. NR 140.28, Wis. Adm. Code. The groundwater was evaluated by looking at the groundwater data from June 2, 2021 – December 1, 2025.

Background Groundwater Quality

The parameter nitrite + nitrate infrequently exceeded the PAL in the background groundwater samples. The trend of the results is erratic.

Down-Gradient Groundwater Quality

Nitrite + nitrate exceeded the ACL occasionally in the down-gradient groundwater monitoring wells 802 and 806. The exceedances were sporadic in magnitude and without a clear trend. See Figure 1.

There were two exceedances of the TDS PAL observed in groundwater monitoring well 802. The exceedances were low in magnitude and sporadic in timing.

Land Disposal System Impact to Groundwater Quality

Concentrations and trends in the groundwater monitoring data were compared to the loading data for the land disposal system. There is not a clear correlation between the effluent loading levels of nitrite + nitrate and the groundwater monitoring results.

Proposed Groundwater Monitoring Requirements

Table 7 Groundwater Quality Sampling Frequency and Limits Permit WI-0060895-11
Outfall 001

Sample Point	Well Name	Sample Frequency	Well Designation
801	MW1	***Quarterly**	Background
802	MW2	***Quarterly**	Point of Standard
803	MW3	***Quarterly**	Non-Point of Standard
804	MW4	***Quarterly**	Point of Standard
806	MW5	***Quarterly**	Point of Standard
Parameter	PAL	ES	Source
Depth to Groundwater	N/A	N/A	Measured
Groundwater Elevation	N/A	N/A	Measured
Nitrogen, Nitrite + Nitrate	***2.7 mg/l**	10.0 mg/l	NR 140 Table 1
Chloride	125 mg/l	250 mg/l	NR 140 Table 2
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	NR 140 Table 1
Nitrogen, Organic	***2.4 mg/l**	N/A	Calculated
Total Dissolved Solids	490 mg/l	N/A	Calculated
Nitrogen, Total	N/A	N/A	Measured

* Proposed permit changes

Indicator Parameter PALs

Indicator Parameter PALs are developed following the procedures described in s. NR 140.20(2), Wis. Adm. Code. Indicator parameters do not have Enforcement Standards. The PAL for an indicator parameter is a benchmark for evaluating site specific trends. When significant increases in the trends are observed, the facility and the department's response action under s. NR 140.24, Wis. Adm. Code should be to investigate the source of the compound. The following equations were used to calculate the indicator parameter PALs:

$\sum$ [Mean of the background groundwater quality + Minimum Increase (NR 140.20 Table 3)] = PAL

And for pH:

$\sum$ [Mean of the background groundwater quality $\pm$ 1 su] = upper and lower PAL

Alternative Concentration Limits

Alternative concentration Limits (ACLs) can be developed and provided for a groundwater monitoring system utilizing the procedures described in s. NR 140.28, Wis. Adm. Code. ACLs were calculated using the following equation:

$\sum$ [Mean of the background groundwater quality +(2) x Standard Deviation of Results] = ACL

Conclusions

There are no recommended changes to the sampling parameters or limits for Outfall 001 (effluent) requirements.

The Groundwater Sampling Frequency should be increased from twice a year to quarterly. The reason being to add additional data points to evaluated variations in groundwater sampling results.
The ACL for nitrite + nitrate has been reduced from 4.5 to 2.7 mg/l based on background groundwater sampling results in well 801. The PAL for organic nitrogen has been increased slightly from 2.2 to 2.4 mg/l based on background groundwater sampling results.

There were nitrite + nitrate exceedances of the ACL in wells 802 and 806. In addition, with the recalculated ACL for nitrite + nitrate it is assumed that if the current trends in groundwater concentrations persist the new limit will be frequently exceeded.

The department recommends optimization of the load and rest cycles in attempt to address the nitrite + nitrate PAL exceedances. These efforts would reduce any impact from the lowering of the ACL for this compound. This action would be considered a s. NR140.24, Wis. Adm. Code response action.

Compliance Schedule Recommendations

The s. NR 206.07 (2)(h) 1, Wis. Adm. Code requires a land disposal management plan for facilities with land disposal systems. The facility should review their plan within 90 days of permit reissuance, and any revisions should be submitted to the department for approval.

The process of optimizing load rest cycles for absorption ponds is to ensure there are adequate logs. The logs should identify which pond is being loaded and include the start and end date/time for loading, the loaded volume and a date/time for when the ponds go dry (dry meaning there is no longer visible standing water on the base of the pond). Once a trend for this data can be established, the rest periods should be increased incrementally allowing time for equilibration.