Permit Fact Sheet

General Information

Permit Number	WI-0023698-10-0
Permittee Name and Address	VILLAGE OF DALLAS PO BOX 84, DALLAS, WI 54733
Permitted Facility Name and Address	Village of Dallas WWTF 221 17th Street, Dallas, WI
Permit Term	April 1, 2026 to March 31, 2031
Discharge Location	East bank of Upper Pine Creek (N½, SW¼ of Section 24 in T32N-R12W)
Receiving Water	Upper Pine Creek in the Pine Creek and Red Cedar River Watershed within the Lower Chippewa River Basin – Barron County
Stream Flow ($Q_{7,10}$)	5.8 cfs
Stream Classification	Cold water (CW) community, non-public water supply, Tainter Lake / Lake Menomin TMDL and within the ceded territory.
Wild Rice Impacts:	No impacts identified. No wild rice waters inventoried on the surface water.
Discharge Type	Existing continuous discharger
Annual Average Design Flow (MGD)	0.076 MGD
Industrial or Commercial Contributors	None
Plant Classification	A4 - Ponds, Lagoons and Natural Systems; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Dallas wastewater treatment facility serves a population of approximately 358 with no significant industrial contributors. The annual average design flow is 76,000 gallons per day with current flows averaging 50,000 gallons per day (2020 – 2024 data). Treatment consists of two aerated ponds operated one after another (in series). Within these ponds naturally occurring bacteria and organisms already present in the wastewater metabolize organic matter. The treated wastewater (effluent) is disinfected by ultraviolet lights seasonally (May 1 through September 30 annually) before discharge to Upper Pine Creek in Barron County.

Substantial Compliance Determination

A Notice of Violation and an Enforcement Conference was held during the current permit term. Based on review of department records and an inspection by Carson Johnson, WDNR, on July 2, 2024, Dallas has failed to submit:

- DMRs 25 out of 29 times during the years of 2022, 2023 and 2024.
- The 2021 lagoon sludge monitoring analysis.
- The 2021, 2022, and 2023 CMARs.
- The updated CMOM documentation by September 30, 2020.
- Annual influent report for the years of 2022, 2023 and 2024.

- Annual phosphorus progress report #4 and its final phosphorus report by January 31, 2023, and January 31, 2024, respectively.

And Dallas did not have a certified operator between May 2, 2023, and July 1, 2024.

Following enforcement, the Village of Dallas completed all missing reports noted during the previous inspection. The permittee has hired a new operator, and they have temporarily hired a consultant to help run the facility while the new operator is being trained. Due to significant improvements in the operation of the wastewater treatment facility, including reporting, further enforcement is no longer necessary. The Village of Dallas is now in substantial compliance with their current WPDES 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 0.050 MGD (2020-2024 data)	Representative samples shall be taken at the final lift station (on Second Ave. South) prior to the aerated ponds.
002	EFFLUENT An average of 0.041 MGD (2020-2024 data)	Representative samples shall be taken immediately after the V-notch weir outside the disinfection building.
003	SLUDGE An estimated 2 dry tons. Sludge last removed in 1995.	Representative samples shall be collected from the accumulated lagoon sludge at various locations and depths that are composited for analysis.

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	
BOD5, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	

Changes from Previous Permit:

Influent 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.

- The sample frequency for flow has been changed from "continuous" to "daily" to reflect currently acceptable practices at the facility

Explanation of Limits and Monitoring Requirements

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

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 002- EFFLUENT DISCHARGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Total Daily	
BOD5, Total	Monthly Avg	30 mg/L	Weekly	Grab	
BOD5, Total	Weekly Avg	45 mg/L	Weekly	Grab	
Suspended Solids, Total	Monthly Avg	30 mg/L	Weekly	Grab	
Suspended Solids, Total	Weekly Avg	45 mg/L	Weekly	Grab	
pH Field	Daily Max	9.0 su	2/Week	Grab	
pH Field	Daily Min	6.0 su	2/Week	Grab	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	108 mg/L	2/Week	Grab	Limit is effective August – September.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	68 mg/L	2/Week	Grab	Limit is effective October – November.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	34 mg/L	2/Week	Grab	Limit is effective December – July.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	108 mg/L	2/Week	Grab	Limit is effective August – November.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	34 mg/L	2/Week	Grab	Limit is effective December – July.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	Grab	Enter the daily ammonia result on the eDMR and

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					compare to the Nitrogen, Ammonia Variable Limit column to determine compliance.
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	See Table	Using the daily pH result look up the applicable ammonia limit in permit section 2.2.1.2 and report the variable limit on the eDMR.
Phosphorus, Total	Monthly Avg	3.5 mg/L	2/Week	Grab	The variance interim limit begins upon the permit effective date and extends until September 30, 2030 when it will be effective only in the months of July - September. See permit section 2.2.1.3 and permit schedule 4.1 for more information.
Phosphorus, Total	Monthly Avg	1.0 mg/L	2/Week	Grab	This variance limit begins October 1, 2030 and is effective January - June and October - December. See permit section 2.2.1.3 and permit schedule 4.1 for more information.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See the Total Maximum Daily Load (TMDL) Limitations permit section.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR. See the Total Maximum Daily Load (TMDL) Limitations permit

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					section.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September. See permit section 2.2.1.5. Enter the result in the DMR on the last day of the month.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	Grab	See permit section 2.2.1.6 for testing schedule.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	Grab	See permit section 2.2.1.6 for testing schedule.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Total Nitrogen = Total Nitrogen Kjeldahl (mg/L) + Nitrite + Nitrate Nitrogen (mg/L). See permit section 2.2.1.6 for testing schedule.

Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

- The sample frequency for **flow** has been changed from "continuous" to "daily" to reflect currently acceptable practices at the facility.
- Seasonal weekly and monthly **ammonia** limits have been added.
- **Ammonia variable limits** are in effect year-round, previously they were effective only December through July.
- The monitoring frequency for **pH**, **ammonia**, and **phosphorus** has increased from weekly to twice a week to reflect the standard monitoring requirements of similar facilities.
- The permittee has applied for a variance from the water quality standard for **phosphorus** pursuant to s. 283.15, Wis. Stats. An interim (variance) phosphorus limit of 3.5 mg/L applies on the permit effective date pursuant to a phosphorus compliance schedule in the permit. At the end of the schedule a variance limit of 1.0 mg/L must be met January – June and October – December and a limit of 3.5 mg/L effective July – September. This variance request must be approved by U.S. EPA.
- **Fecal Coliform** monitoring and limits have been replaced by **Escherichia coli (E. coli)** based on revisions to multiple rules
- Annual **Total Nitrogen** Monitoring **(TKN, N02+N03 and Total N)** is required in specific quarters as outlined in the permit.

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated March 25, 2025.

Ammonia - Using current acute and chronic ammonia toxicity criteria found in Tables 2C and 4B of NR 105 Wis. Adm. Code and limit calculating procedures (Subchapter IV of 106, Wis. Adm. Code ammonia limitations were calculated for the facility. Based on a reasonable potential analysis it was found ammonia limits are needed to ensure toxic conditions in the receiving water do not occur.

- Weekly average limits of 108 mg/L (August through November) and 34 mg/L (December through July) and monthly average limits of 108 mg/L (August through September), 68 mg/L (October through November) and 34 mg/L (December through July) apply.
- Daily maximum limits expressed as a single limit or as a variable limit based on effluent pH were calculated. Expression as a variable limit will continue. Sample results for pH shall be used to calculate the daily variable limit. Total ammonia (NH3-N) sampling shall occur on the same day pH levels are monitored. The variable limit table remains the same as the previous permit term, but the limits are now in effect year-round because the 20 and 40 mg/L seasonal thresholds are no longer in effect following changes to NR 106.33(2) which took effect on September 1, 2016. Report the effluent ammonia sample result in the 'Nitrogen, Ammonia (NH3-N) Total' column. Compare the variable daily maximum ammonia limit to the reported ammonia result, record the number of exceedances in the box to the right of the 'Limit in Effect' 'Daily Max' row in the 'Summary' tables at the end of the eDMR.

Variable Limits Table

Daily maximum ammonia limits based on Effluent pH

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

Phosphorus: Phosphorus requirements are based on NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. The final limits are 0.225mg/L as a monthly average, 0.075 mg/L as a six-month average and 0.048 lbs/day six-month average. These limits are beyond the capabilities of the Village's current treatment plant. Pursuant to s. 283.15, Wis. Stats., Dallas has applied for a variance from the water quality standards for phosphorus contained in ch. NR 102, Wis. Adm Code. The permittee has submitted documentation to show that complying with the water quality standard would result in annual average residential sewer user fees in excess of 2% of the median household income for Dallas and may cause widespread adverse social and economic impacts within the village. As conditions of this variance Dallas shall maintain effluent quality at or below the interim effluent phosphorus limitation of 3.5 mg/L from the permit effective date until completion of the phosphorus schedule contained in section 4.1 of the permit when variance limits of 1.0 mg/L is effective January – June and October – December and 3.5 mg/L July – September. The variance request must be submitted to EPA for review and approval before the variance can be included in this permit.

Fecal Coliform and E. coli - Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits. E. coli limits of 126 #/100 ml as a monthly geometric mean that may never be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month apply.

The following equation should be used to calculate percent exceedances.

$$\frac{\text{\# of Samples greater than 410\#/100}}{\text{Total \# of samples}} \times 100 = \% \text{ Exceedance}$$

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

Nitrogen Series - (nitrite +nitrate, total Kjeldahl nitrogen and total nitrogen) **–** In 2011, the Upper Mississippi River Basin Association (UMRBA) completed the report "Upper Mississippi River Nutrient Monitoring, Occurrence, and Local Impacts: A Clean Water Act Perspective". Among the many recommendations of this report was that the states should expand their NPDES discharge monitoring requirements to include both phosphorus and nitrogen as they have important impacts on the mainstem upper Mississippi River as well as in the Gulf of Mexico. Consequently, the department developed the "Guidance for Total Nitrogen Monitoring in WPDES Permits" document dated October 2019, where annual effluent monitoring for total nitrogen (total nitrogen = total Kjeldahl + (nitrite+nitrate)) is required for municipal and industrial facilities discharging to surface waters. Section 283.55(1)(e) Wis. Stats. allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and s. NR 200.065 (1)(h) Wis. Adm. Code allows for this monitoring to be collected during the permit term. The schedule for this facility is as follows:

- July – September 2026
- October – December 2027
- January – March 2028
- April – June 2029
- July – September 2030

Nitrogen Series monitoring shall continue after the permit expiration date (until the permit is reissued) in accordance with the monitoring requirements specified in the last full calendar year of this permit. For example, the next test would be required July – September 2031

PFOS and PFOA – NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), 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 information available at the time the proposed permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term.

Previously permitted weekly monitoring frequency for pH falls below the standard monitoring frequency outlined in guidance. The monitoring frequency has been increased to twice weekly to match ammonia monitoring. It is still below the standard monitoring frequency, but data submitted during the previous permit term shows consistent compliance with permit limitations, and the set monitoring frequency is consistent with requirements of state code. If performance levels begin to vary during the permitted term, the department may re-evaluate current sampling frequencies and implement more frequent monitoring via permit modification or at permit reissuance.

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)**
003	B	Liquid	Sludge was last removed in 1995, and removal 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 set of samples (2020) were below the level of detection.						
Is a priority pollutant scan required? No						

3.1 Sample Point Number: 003- Lagoon Sludge

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

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
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, Ammonia (NH3-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	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) and **PCB** monitoring is required during 2027.

- Because it's recommended that **List 2** (Nutrients) are monitored with the List 1 monitoring, they have been added to the table.
- **PFAS** monitoring is required once pursuant to s. NR 204.06(2)(b)9., Wis. Adm. Code.
- 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.

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 2027. 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 2027 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 2027 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" will 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 the proposed WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

4 Schedules

4.1 Phosphorus Variance Interim Limit

The permittee shall comply with the interim effluent limit by the end of this compliance schedule.

Required Action	Due Date
Submit Final Compliance Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code. The permittee may submit an abbreviated facility plan if the modifications are determined to be minor according to the Department].	03/31/2028
Submit Plans & Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Wis. Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with the interim phosphorus effluent limit and a schedule for completing construction of the upgrades by the 'Complete Construction' date specified below.	03/31/2029
Treatment Plant Upgrade: Upon approval of the final construction plans and schedule by the Department and pursuant to s. 281.41, Wis. Stats., the permittee shall initiate construction of the treatment plant upgrades in accordance with the approved plans and specifications.	03/31/2030
Complete Construction, Achieve Compliance and Final Phosphorus Report: The permittee shall complete construction and achieve compliance with the phosphorus interim effluent limit of 1.0 mg/L January - June and October - December and 3.5 mg/L July - September. Submit a report on the phosphorus reductions achieved through the upgrade. Summarize phosphorus source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the approved Phosphorus Minimization Plan were not pursued and why. Additionally, if the permittee intends to seek a renewed phosphorus variance per s. 283.15, Wis. Stats. the report shall declare that intention and include a proposed variance limit. An updated Phosphorus Minimization Plan and Variance Application must be submitted with or before the WPDES application deadline (180-days prior to permit expiration).	09/30/2030

4.1.1 Explanation of Schedule

Phosphorus Variance Interim Limit - The permittee is required to initiate a treatment plant upgrade to meet interim phosphorus limits of 1.0 mg/L (January – June and October – December) and 3.5 mg/L (July – September) by September 30, 2030. An interim limit of 3.5 mg/L applies on the permit effective date through the completion of the plant upgrade.

4.2 Sludge Management Plan

Required Action	Due Date
Submit a Sludge Management Plan: The permittee shall submit a 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.	

4.2.1 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 Quality Based Effluent Limits (WQBEL) memo, dated March 25, 2025

Phosphorus Pollutant Minimization Plan, dated September 2025

Phosphorus Variance EPA Data Sheet

Justification Of Any Waivers From Permit Application Requirements

A decision has been made not to require effluent monitoring for metals in the application because:

1. The low design flow (76,000 MGD) and low actual flows (an average of 50,000 MGD) from this facility.
2. The wastewater is all domestic with no industrial contributors to the collection system.
3. The metals in the sludge are well below high quality sludge limits which correlates to low metal concentrations in the effluent.
4. Based on the total points accumulated on the WET checklist and Chapter 1.3 of the WET Guidance Document there is little likelihood the effluent is toxic.

Prepared By: Sheri A. Snowbank Wastewater Specialist **Date:** August 14, 2025

Revised By: Sarah Donoughe, Wastewater Specialist-Adv **Date:** September 17, 2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: March 25, 2025

TO: Sarah Donoughe, Variance Coordinator – NER/Green Bay Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center Michael Polkinghorn

SUBJECT: Water Quality-Based Effluent Limitations for the Village of Dallas
WPDES Permit No. WI-0023698-10-0

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 Village of Dallas in Barron County. This municipal wastewater treatment facility (WWTF) discharges to Upper Pine Creek, located in the Pine Creek and Red Cedar River Watershed in the Lower Chippewa Basin. This discharge is included in the Tainter Lake/Lake Menomin (TL/LM) Total Maximum Daily Load (TMDL) as approved by EPA on 09/14/2012. 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 002:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5			45 mg/L	30 mg/L		1, 2
TSS			45 mg/L	30 mg/L		1, 2
pH	9.0 s.u.	6.0 s.u.				1, 2
E. coli May – September				126 #/100 mL geometric mean		3
Ammonia Nitrogen Year round August – September October – November December – July	Variable		 **108 mg/L** **108 mg/L** **34 mg/L**	 **108 mg/L** **68 mg/L** **34 mg/L**		4, 5
Phosphorus						6
Interim				3.5 mg/L		
Final (TMDL) Final (WQBEL)				1.2 lbs/day 0.225 mg/L	0.075 mg/L 0.048 lbs/day	
TKN, Nitrate+Nitrite, and Total Nitrogen						7

Footnotes:

1. No changes from the current permit.
2. These limits are based on the Cold Water (CW) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
4. 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.

5. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit.

Daily Maximum Ammonia Nitrogen Limits

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

6. If the phosphorus variance application that was submitted is approved by EPA, the interim limit of 3.5 mg/L as a monthly average may be extended beyond the end of the compliance schedule along with a requirement for total phosphorus pollutant minimization program. The monthly average phosphorus mass limit is based on the TL/LM TMDL to address phosphorus water quality impairments within the TMDL area.
7. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).

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

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Michael Polkinghorn at (715) 360-3379 or Michael.Polkinghorn@wisconsin.gov and Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, discharge area map, & thermal table.

PREPARED BY: Michael A. Polkinghorn – Water Resources Engineer

E-cc: Carson Johnson, Wastewater Engineer – NOR/Spooner Service Center
Michelle BalkLudwig, Regional Wastewater Supervisor – NOR/Spooner Service Center
Sheri Snowbank, Regional Permit Drafter – NOR/Spooner Service Center
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Village of Dallas

WPDES Permit No. WI-0023698-10-0

Prepared by: Michael A. Polkinghorn

PART 1 – BACKGROUND INFORMATION

Facility Description

Treatment consists of two aerated ponds operated in series. Within these ponds naturally occurring bacteria and organisms already present in the wastewater break down the organic matter until the wastewater is able to meet discharge standards. An old seepage cell and effluent pH adjustment equipment are on site but are no longer in use. These systems will likely need some repair prior to use, if needed. Wastewater is disinfected by ultraviolet (UV) lights during May – September. Effluent is discharged on a continuous basis via Outfall 002 to the east bank of Upper Pine Creek.

Attachment #2 is a discharge area map of Outfall 002.

Existing Permit Limitations

The current permit, expired on 09/30/2024, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5			45 mg/L	30 mg/L		1, 2
TSS			45 mg/L	30 mg/L		1, 2
pH	9.0 s.u.	6.0 s.u.				1, 2
Fecal Coliform May – September			**656#/100 mL** **geometric mean**	400#/100 mL geometric mean		3
Ammonia Nitrogen December – July	Variable		**34 mg/L**	**34 mg/L**		3, 4
Phosphorus						5
Interim				3.64 mg/L		
Final				0.63 lbs/day		

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 Cold Water (CW) community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.

3. 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.
4. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit.

Daily Maximum Ammonia Nitrogen Limits

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

5. The interim limit was required under the individual phosphorus variance approved by EPA. The phosphorus mass limit is based on the TL/LM TMDL to address phosphorus water quality impairments within the TMDL area.

Receiving Water Information

- Name: Upper Pine Creek
- Waterbody Identification Code (WBIC): 2087300
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Cold Water (CW) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following $7\text{-}Q_{10}$ and $7\text{-}Q_2$ values are the sum of the low flows estimated by USGS Station LC68 for Upper Pine Creek (CTH U, 1.1 mi north of Dallas, WI) and East Branch Upper Pine Creek (CTH U, 0.6 mi north of Dallas, WI).
  $7\text{-}Q_{10} = 5.8$ cubic feet per second (cfs)
  $7\text{-}Q_2 = 8.2$ cfs
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Multiple dischargers: None.
- Impaired water status: Upper Pine Creek is on the Clean Water Act Section 303(d) list for a phosphorus impairment (stream mi 2.32 – 11.32). This discharge is included in the TL/LM TMDL to address phosphorus water quality impairments within the TMDL area.

Effluent Information

- Design flow rate(s):
  Annual average = 0.076 million gallons per day (MGD)
  For reference, the actual average flow from October 2019 – January 2025 was 0.041 MGD.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable –

this facility does not have an approved Zone of Initial Dilution (ZID).

- Water source: Domestic wastewater with no industrial contributors. Water supply from municipal waterworks.
- Additives: None.
- Effluent characterization: This facility is categorized as a minor municipality and received instructions in the application notification letter that exempt it from standard monitoring requirements.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

The following table presents the average concentrations and loadings at Outfall 002 from October 2019 – January 2025 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement*
BOD_5	14 mg/L
TSS	12 mg/L
pH field	6.9 s.u.
Fecal Coliform	18 #/100 mL**
Ammonia Nitrogen	14.5 mg/L
Phosphorus	2.37 mg/L

*Any results below the level of detection (LOD) were included as zeroes in calculation of average.
**Average is calculated as a geometric average.

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

Mercury – The permit application did not require monitoring for mercury because the Village of Dallas 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." The concentration in the sludge from 07/17/2024 was nondetectable at <1.8 mg/kg. **Therefore, mercury monitoring is not recommended during the reissued permit term.**

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

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

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

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The need for limits during August – November.

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 ATC for ammonia is calculated using the following equation:

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

Where:

A = 0.411 and B = 58.4 for a CW community (Category 5), and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 273 sample results were reported from October 2019 – January 2025. The maximum reported value was 7.8 s.u. (Standard pH Units). The effluent pH was 7.7 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.8 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.7 s.u. Therefore, a value of 7.8 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.8 s.u. into the equation above yields an ATC = 12.96 mg/L.

Daily Maximum Ammonia Nitrogen Effluent Limitations Calculation Method

Daily maximum effluent limitations for toxic substances are based on the 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.

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

Where:

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

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

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.
f = Fraction of the effluent flow that is withdrawn from the receiving water, and
Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. 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

Method	Ammonia Nitrogen Limit (mg/L)
2×ATC	26
1-Q_{10}	520

The 2×ATC method yields the most stringent limits for the Village of Dallas.

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

Daily Maximum Ammonia Nitrogen Limits – CW Community (Category 5)

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

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
The ammonia limit calculation also warrants evaluation of weekly and monthly average limits based on chronic toxicity criteria (CTC) for ammonia, because those limits relate to the assimilative capacity of the receiving water.

Weekly average and monthly average limits for ammonia nitrogen are based on CTC in ch. NR 105, Wis. Adm. Code. The 30-day CTC for ammonia in waters classified for a CW community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 0.854,
C = the minimum of 2.85 or $1.45 \times 10^{(0.028 \times (25 - T))}$,
T = the temperature (ºC) of the receiving water

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.

Weekly & Monthly Ammonia Nitrogen Limits – CW Community

		Spring	Summer	Winter
		April – May	June – Sept.	Oct. - March
Effluent Flow	Qe (MGD)	0.076	0.076	0.076
Background Information	7-Q_{10} (cfs)	5.8	5.8	5.8
	7-Q_2 (cfs)	8.2	8.2	8.2
	Ammonia (mg/L)	0.07	0.04	0.08
	Average Temperature (°C)	12	19	4
	Maximum Temperature (°C)	14	21	10
	pH (s.u.)	7.5	7.5	7.5
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	2.9	5.8	1.5
	Reference Monthly Flow (cfs)	3.5	7.0	1.7
Criteria (mg/L)	4-day Chronic	10.91	7.39	10.91
	30-day Chronic	4.36	2.96	4.36
Effluent Limits (mg/L)	Weekly Average	278	370	144
	Monthly Average	132	176	68

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from October 2019 – January 2025, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Village of Dallas permit for the respective month ranges. That need is determined by calculating 99th upper percentile (or P_{99}) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

Ammonia Nitrogen Effluent Data

Statistics (mg/L)	April - May	June - September	October - March
1-day P_{99}	26.9	41.4	28.5
4-day P_{99}	19.5	24.8	21.6

30-day P_{99}	15.5	16.4	17.9
Mean*	13.6	12.6	16.0
Std	4.4	8.0	4.3
Sample size	42	84	145
Range	4.1 - 23.3	0.2 - 72.5	5.5 - 25.9

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

Based on this comparison, **daily maximum limits are recommended year round during the reissued permit term.**

Expression of Limits
Revisions to ch. NR 106, Wis. Adm. Code, in September 2016 aligned Wisconsin's WQBELs with 40 CFR § 122.45(d), which specifies that effluent limits for continuous dischargers must be expressed as weekly and monthly averages for publicly owned treatment works and as daily maximums and monthly averages for all other dischargers, unless shown to be impracticable. Because a daily maximum ammonia limit is necessary for Village of Dallas, weekly and monthly average limits are also required under this code revision.

The methods for calculating limitations for municipal treatment facilities to conform to 40 CFR 122.45(d) are specified in s. NR 106.07(3), Wis. Adm. Code, and are as follows:

> Whenever a daily maximum limitation is determined necessary to protect water quality, a weekly and monthly average limitation shall also be included in the permit and set equal to the daily maximum limit unless a more restrictive limit is already determined necessary to protect water quality.

In this case, the recommended daily maximum limits vary with effluent pH, so additional limits should be set equal to the highest recommended limit of 108 mg/L unless the respective calculated weekly/monthly average WQBEL or existing permit limit are more stringent. **Therefore, the following limits are required:**

- **August – September: Weekly and monthly average limits of 108 mg/L.**
- **October – November: Weekly average limit of 108 mg/L and monthly average limit of 68 mg/L.**
- **December – July: The current permit weekly and monthly average limits of 34 mg/L.**

Conclusions and Recommendations
In summary, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.

Final Ammonia Nitrogen Limits

Month Range	Daily Maximum (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)
August – September	Variable	**108**	**108**

October – November	Variable	**108**	**68**
December – July	Variable	**34**	**34**

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

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

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

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

Effluent Data
The Village of Dallas has monitored effluent *E. coli* during July 2024 – September 2024 and a total of 13 results are available. A geometric mean of 126 counts/100 mL was never exceeded, with a maximum monthly geometric mean of 2.7 counts/100 mL. Effluent data has never exceeded 410 counts/100 mL, with a maximum reported value of 53 counts/100 mL. Monitoring was not completed during May – June of the disinfection season so it is not certain if the facility would meet the *E. coli* limits during those months. However, the facility's disinfection technology is UV light so it is expected treatment during May – June will be consistent as was demonstrated during July – September. **Therefore, it appears that the facility can meet the new *E. coli* limits and a compliance schedule is not needed in the reissued permit.**

PART 5 – PHOSPHORUS

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

Because Village of Dallas does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance with s. NR 217.04(1)(a)1, Wis. Adm. Code. **Therefore, a technology-based limit is not recommended**

during the reissued permit term. In addition, the need for a WQBEL for phosphorus must be considered.

Annual Average Mass Total Phosphorus Loading

Month	Average Phosphorus Concentration (mg/L)	Total Effluent Flow (Million Gallons)	Calculated Mass (lbs/month)
Feb. 2024	2.67	0.81	18
March 2024	2.68	0.95	21
April 2024	2.70	2.04	46
May 2024	2.62	1.66	36
June 2024	2.02	2.56	43
July 2024	1.79	2.14	32
Aug. 2024	1.81	1.20	18
Sept. 2024	2.07	0.87	15
Oct. 2024	2.10	0.69	12
Nov. 2024	1.89	0.60	10
Dec. 2024	2.35	0.60	12
Jan. 2025	3.14	0.60	16
		Average =	23

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
Where total flow is the sum of the actual flow (MGD) for that month

Water Quality-Based Effluent Limits (WQBEL)

Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

The TL/LM TMDL report was written to ensure that phosphorus water quality criteria are attained in Tainter Lake and Lake Menomin and are not necessarily protective of phosphorus water quality of other surface waterbodies in the TMDL area. Therefore, the need for a phosphorus WQBEL as described in s. NR 217.13, Wis. Adm. Code, must be considered in addition to any limits required by the TMDL report.

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

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

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

Where:

WQC = 0.075 mg/L for Upper Pine Creek.
Qs = 100% of the 7-Q_2 of 8.2 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.076 MGD = 0.12 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

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

The previous limit evaluation (February 2017) calculated a WQBEL of 3.1 mg/L using a background concentration of 0.038 mg/L based on background data from multiple surface waters in the Lower Pine Creek watershed. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance. Additional data were considered in estimating the background phosphorus concentration.

A review of all available in stream total phosphorus data stored in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration in Upper Pine Creek is 0.182 mg/L at the Upper Pine Creek at 2 ½ Ave. (SWIMS station ID: 10010407), in the same location as Outfall 002. This background data was sampled during May 2012 – October 2012, which is beyond the data timeframe of 10 years considered in code. However, it is considered in this evaluation based on s. NR 102.07(1)(c)2, Wis. Adm. Code, because it is more representative than the previous background estimation being site-specific of both the receiving water and discharge. Also, the impaired water listing of Upper Pine Creek points towards the notion that effluent phosphorus limits equal to the water quality criterion are needed to prevent the discharge from contributing to further impairment of the receiving water. *The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020)* suggests setting effluent limits equal to the criterion in the absence of an EPA approved total maximum daily load for discharges of phosphorus into phosphorus impaired waters. Therefore, the applicable phosphorus WQBEL will be set equal to criteria.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from November 2021 – January 2025. The facility conducted a chemical phosphorus removal pilot study using ferric chloride during July 2020 – October 2020. This effluent data is not considered representative of the discharge and is excluded from this evaluation.

Total Phosphorus Effluent Data

Statistics	Conc. (mg/L)
1-day P_{99}	4.61
4-day P_{99}	3.47
30-day P_{99}	2.86
Mean	2.55
Std	0.70
Sample size	218
Range	0.56 - 4.24

Reasonable Potential Determination
The discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion because the 30-day P_{99} of reported effluent total phosphorus data is greater than the calculated WQBEL. **Therefore, a phosphorus WQBEL is recommended during the reissued permit term.**

Limit Expression
According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, **the effluent limit of 0.075 mg/L may be expressed as a 6-month average.** If a concentration limitation expressed as a 6-month average is included in the permit, **a monthly average concentration limitation of 0.225 mg/L, equal to three times the WQBEL calculated under s. NR 217.13, Wis. Adm. Code shall also be included in the permit.** The 6-month average should be averaged during the months of May – October and November – April.

Mass Limits
A mass limit is also required, pursuant to s. NR 217.14(1)(a), Wis. Adm. Code, because the Upper Pine Creek has a phosphorus impairment. **This final mass limit shall be 0.075 mg/L × 8.34 × 0.076 MGD = 0.048 lbs/day expressed as a 6-month average.**

TMDL Limit
The TL/LM TMDL expresses WLAs for TP as maximum annual loads (lbs/yr) and maximum daily loads (lbs/day), which equal the maximum annual loads divided by the number of days in the year. For the Village of Dallas, these phosphorus WLAs are 231 lbs/yr and 0.63 lbs/day.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the TL/LM TMDL are given monthly average mass limits since the TL/LM TMDL WLAs are derived on an effluent concentration of 1 mg/L or greater. Because the existing TMDL limit determined in the previous limit evaluation (February 2017) is not consistent with the TMDL due to being set equal to the WLA, it will be reevaluated at this time.

TP Monthly Average Permit Limit = daily WLA * monthly average multiplier
= 0.63 lbs/day * 1.90
= 1.2 lbs/day

The multiplier used in the monthly average calculation was used as recommended in TMDL implementation guidance. It is believed that the optimization of the wastewater treatment system to achieve the WLA-derived phosphorus permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by any facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as weekly; if a different monitoring frequency is used, the stated limit should be reevaluated.

The monthly average mass limit of 1.2 lbs/day is recommended during the reissued permit term rounding to 2 significant figures. This limit is equivalent to the concentration of 1.9 mg/L at an effluent flow of 0.076 MGD.

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

Interim Limit
An interim limit is required per s. NR 217.17, Wis. Adm. Code, when a compliance schedule is needed in the permit to meet the WQBEL. The interim limit should reflect a concentration that the facility is able to meet without investing in additional "temporary" treatment, but also should prevent backsliding from current conditions. **Therefore, it is recommended that the interim limit be set equal to 3.5 mg/L for permit reissuance along with requirements for optimization of phosphorus removal.** This value reflects the 4-day P_{99} concentration of 3.47 mg/L during November 2021 – January 2025. The facility would have been in compliance with this limit 95% of the time during the same time period or only 2 of the last 39 monthly average phosphorus concentrations exceeded 3.5 mg/L.

Variance Request
The Village of Dallas currently has an EPA approved individual phosphorus variance applicable during the current permit term The interim limit of 3.64 mg/L is applicable until the end of the current permit term. The facility has reapplied for an individual variance under s. 283.15, Wis. Stats. Eligibility for the variance is not included as part of this review. If a variance is granted and reapproved by EPA**, the recommended monthly average interim limit of 3.5 mg/L may be extended beyond the current permit term.**

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from October 2019 – January 2025.

The calculated temperature limits are included in the table below. The full temperature limit calculations are included as attachment #3.

Attachment #1

Monthly Temperature Effluent Data & Limits

Month	Calculated Effluent Limit	
	Weekly Average Effluent Limitation (°F)*	Daily Maximum Effluent Limitation (°F)
JAN	NA	120
FEB	NA	120
MAR	NA	120
APR	116	120
MAY	NA	120
JUN	111	116
JUL	94	120
AUG	93	120
SEP	114	120
OCT	87	120
NOV	NA	120
DEC	NA	120

* NA denotes "not applicable" when the calculated weekly average limit is greater than or equal to 120 °F.

Lagoon-based systems utilize long hydraulic detention times and discharge small volumes of effluent consisting of domestic wastewater; therefore, elevated effluent temperatures are unlikely and discharge temperatures are expected to be similar to ambient conditions below 87 °F. There is no reasonable potential for the discharge to exceed this limit; **therefore, temperature limits or monitoring are not recommended during the reissued permit term.**

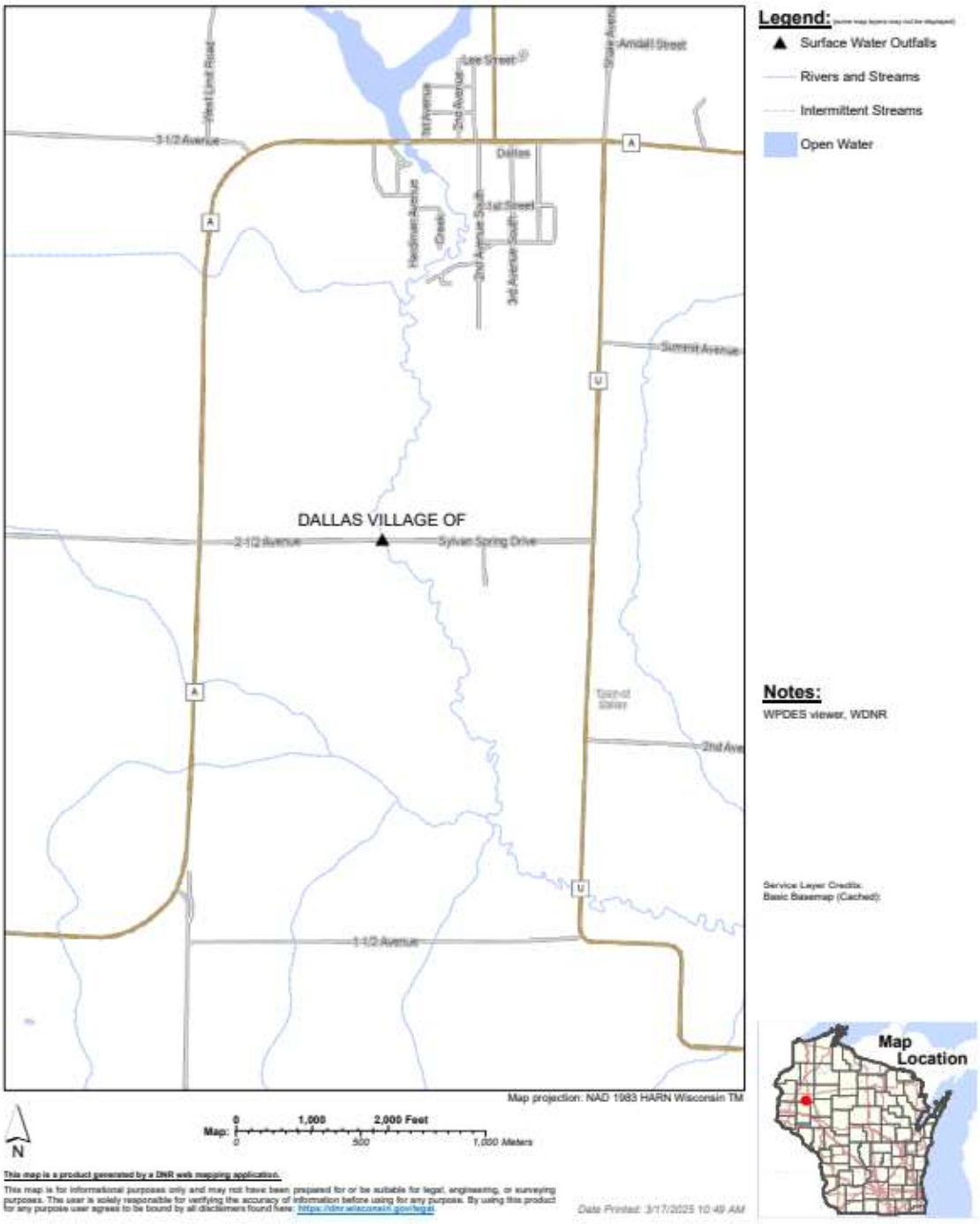
PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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. **No WET testing is recommended at this time because of the low risk in effluent toxicity.**

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Dallas Outfall 002 Discharge Area



Attachment #3

Temperature Limits for Receiving Waters with Unidirectional Flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Village of Dallas		**7-Q_{10}:**	5.8	cfs		
Outfall(s):	002		**Dilution:**	25%		**Start:** NA	10/03/19
Date Prepared:	3/17/2025		**f:**	0		**End:** NA	01/31/25
Design Flow (Qe):	0.076	MGD	**Stream type:**	Cold water community			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	12.3	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	35	47	68	5.8	0.045	0.050	0			NA	120
FEB	36	47	68	5.8	0.039	0.059	0			NA	120
MAR	39	51	69	5.8	0.074	0.091	0			NA	120
APR	47	57	70	5.8	0.160	0.221	0			116	120
MAY	56	63	72	5.8	0.096	0.112	0			NA	120
JUN	62	67	72	5.8	0.105	0.213	0			111	116
JUL	64	67	73	5.8	0.103	0.141	0			94	120
AUG	63	65	73	5.8	0.067	0.132	0			93	120
SEP	57	60	72	5.8	0.052	0.067	0			114	120
OCT	49	53	70	5.8	0.110	0.197	0			87	120
NOV	41	48	69	5.8	0.071	0.110	0			NA	120
DEC	37	47	69	5.8	0.049	0.063	0			NA	120

Phosphorus Pollutant Minimization Plan

Village of Dallas
Barron County, Wisconsin
September 2025

Prepared by:

MSA Professional Services
1835 N. Stevens Street
Rhinelander, WI 54501
Phone: 715-362-3244
www.msa-ps.com

Project No. 00504027

There are three categories of Total Phosphorus (TP) sources that can be targeted in a phosphorus Pollutant Minimization Plan (PMP): Reducing influent TP loadings to the facility, reducing effluent TP concentrations, and watershed reductions. This document describes actions that the Village of Dallas may take over the next permit term (5 years from 2026-2030) to help address each of these sources. The attached table shows a proposed timeline and brief summary of actions, which are described in more detail in the following sections.

Economics and Background

As specified in the *Final Phosphorus Report*, the average residential sewer charge is approximately 0.89% of the median household income (MHI), which is $54,167 based on data from the 2018-2022 American Community Survey. While average residential sewer rates are not currently above the 2.0% threshold necessary for an Individual Phosphorus Variance, the small number of users in the Village over which any added annual operating costs and debt payments must be distributed means that any significant capital cost will drive sewer rates to above the 2.0% threshold. Even if no capital projects are pursued at the wastewater treatment facility (WWTF), the Village will need to generate additional revenue for increased operation costs due to collection and distribution system needs and equipment maintenance. Furthermore, the Sewer Utility has outstanding debt service on two existing water infrastructure loans. If the Village pursues a significant capital project to upgrade the collection system or WWTF in the next 20 years (e.g., tertiary filtration), residential sewer rates would likely exceed 2.0% of the MHI, regardless of if the Village were eligible for Clean Water Fund Program (CWFP) Principal Forgiveness grant money. A smaller chemical phosphorus removal project at the WWTF *may* be feasible if no other improvements are included in the project scope.

A major facility upgrade to reduce phosphorus concentrations to comply with future Water Quality Based Effluent Limit (WQBELs) is not economically feasible and would further raise residential sewer rates well above the 2.0% threshold of the MHI due to the very small user base and the existing sewer user rates. Therefore, the Village must pursue an Individual Phosphorus Variance to maintain phosphorus compliance for the next permit term. Any phosphorus reduction project being considered should include a feasibility analysis which carefully explores the financial impact on the community. Ultimately, critical maintenance and repair projects to maintain basic treatment for biochemical oxygen demand (BOD) and total suspended solids (TSS) and to add treatment for *E. coli* should take precedence. Examples of critical items include replacement of lagoon aeration equipment and PVC liners, along with removal of lagoon sludge. Upgrades to address phosphorus requirements should be included in tandem with critical maintenance if economically feasible.

Correspondence with DNR has indicated that a renewed variance may be granted for 2026-2030, but that the Village's interim phosphorus limit will be reduced to 1 mg/L by the end of the permit term, which would necessitate a chemical phosphorus removal upgrade if no alternative compliance solution is found prior to 2028. The interim limit will be relaxed in the summer months to minimize chemical dosing during periods when alkalinity levels in the lagoon system are reduced due to demand by the biological nitrification process. Due to the sewer rate impacts of even chemical phosphorus removal alone, the Village's ideal compliance solution would be a watershed project to eliminate the need for a technology-based upgrade at the WWTF.

Reducing Influent Sources

The Village of Dallas receives flow from a total of 178 residential equivalent users. The main sources of phosphorus in the influent wastewater are domestic-strength sewage from residential, commercial, and public authority users. Hauled waste is currently not accepted at the WWTF. Based on this information, coupled with the low strength of the influent due to clear water entry into the collection system (effluent phosphorus concentrations range from 3-4 mg/L without any treatment), source reduction is unlikely to result in significant changes to phosphorus loading at the WWTF. However, any reduction in influent phosphorus loads will ultimately reduce the expense to the Village for

phosphorus removal through chemical addition and/or purchase of phosphorus credits as discussed further below.

Reducing Effluent Phosphorus Concentrations and Loadings

The Village has near-term equipment replacement needs within their collection and treatment infrastructure that need to be evaluated, prioritized, and planned for. Many of these needs are critical for maintaining compliance with current and future limits for BOD, TSS, and *E. coli*. Longer-term needs that are reasonable to expect within the next 20 years include lift station upgrades, replacement of the lagoon aerators, lagoon liners and rip rap, and replacement of the UV disinfection system. The Village is also in need of extensive collection system rehabilitation efforts. As mentioned previously, maintaining and replacing failing components of the existing collection system and treatment infrastructure to facilitate compliance with the re-issued WPDES permit should be the highest priority for the Village of Dallas.

However, based on recent correspondence with DNR, the Village will implement phosphorus removal technology at the WWTF if no watershed-based solution can be reached in the initial years of the variance. Chemical phosphorus removal technology would allow compliance with the more stringent phosphorus limits which will become effective in 2030. Implementation efforts would likely need to commence by 2028 to allow adequate time for compliance by the end of the variance term. Technology for chemical phosphorus removal would consist of a chemical phosphorus removal system to feed ferric chloride at the transfer manhole between the two lagoons in the zone of turbulent mixing created by the V-notch weir overflow.

Watershed Reduction Program

A watershed-based approach is likely the ideal solution for long term compliance for the Village of Dallas from both an affordability and operations/maintenance standpoint. As a result, the Village will seek a long-term Water Quality trade during the initial years of the variance. The goal of the trade would be to offset all phosphorus discharges above the future WQBEL, eliminating the need for installation of a chemical phosphorus removal system. The Village has already initiated discussions with the Wisconsin Water Quality Trading (WQT) Clearinghouse regarding potential trading partners, and will officially register as a credit buyer with the Clearinghouse promptly upon renewal of the phosphorus variance.

While there are no projects currently available in the watershed, the Clearinghouse is actively seeking projects with promising results. The Village may need to make payment up front for a project due to the lack of established projects, but the payment could be financed through the same funding sources as a WWTF upgrade, and annual debt service is anticipated to be significantly lower than for a technology-based solution and would paid off in annual installments, similar to annual WQT payments. Even if a trade cannot be reached by 2028, the Village will likely still need to use WQT to reach the final WQBEL in combination with chemical phosphorus removal. To reiterate, the ideal scenario for the Village is to enter into a WQT agreement by 2028 to offset all phosphorus discharge above the WQBEL, eliminating the need for a WWTF upgrade. However, if a trade is not reached, DNR has indicated that the Village must complete a chemical phosphorus removal upgrade by 2030. Trading would still be needed at some point for eventual compliance with the final WQBEL.

PMP Activities	1st Year (2026)	2nd Year (2027)	3rd Year (2028)	4th Year (2029)	5th Year (2030)
1. Reducing Influent Sources					
a. Re-engage users in the collection system with a letter requesting reduction or elimination of any phosphorus-containing products which may be entering the collection system.	X				
2. Reducing Effluent TP Concentrations and Loadings					
a. Pursue funding for an upgrade to address critical maintenance needs in the collection system and potentially construct a chemical phosphorus removal system or provide up front payment for a WQT project. Funding would likely come through the Clean Water Fund (CWF) and/or Community Development Block Grant (CBDG) programs.	X	X	X	X	X
b. Evaluate other WWTF and collection system needs		X	X	X	X
c. Commence design and construction of a chemical phosphorus removal system and critical maintenance items if no WQT agreement can be reached.			**	**	**
d. Provide annual updates per compliance schedule	X	X	X	X	X
3. Watershed Reduction Program					
a. Register with the WQT Clearinghouse	X				
b. If projects are identified by the WQT Clearinghouse and determined by the Village to be feasible, including economically feasible, or if more communication is needed, meet with potential trading partners and the WQT Clearinghouse to further discuss options.	**	**	**	**	**
c. Enter a long term water quality trade for offset of phosphorus discharge above WQBEL		**	**	**	**f

X Indicates action taken/started this year

** Indicates follow-up action that may be taken depending on results from previous year – see detailed description

needed.

Section I: General Information

A. Name of Permittee: Village of Dallas

B. Facility Name: Dallas Wastewater Treatment Plant (WWTP)

C. Submitted by: Wisconsin Department of Natural Resources

D. State: Wisconsin **Substance:** Phosphorus **Date completed:** September 17, 2025

E. Permit #: WI-0023698-10-0 **WQSTS #:** (EPA USE ONLY)

F. Duration of Variance **Start Date:** April 1, 2026 **End Date:** March 31, 2031

G. Date of Variance Application: January 9, 2025

H. Is this permit a:
☐ **First time submittal for variance**
☒ **Renewal of a previous submittal for variance** *(Complete Section X)*

I. Description of proposed variance:

The effluent limit is based on the downstream impacts to Upper Pine Creek. The WQC for smaller streams like Upper Pine Creek is 0.075 mg/L and the phosphorus WQBEL calculation formula is cited in NR 217.13 (2)(a), Wis. Adm. Code. The calculated phosphorus WQBELs are 0.075 mg/L and 0.048 lbs/day as 6-month averages and 0.225 mg/L as a monthly average. Given the small size of this facility, a technology-based phosphorus limitation is not warranted. The facility is within the Tainter Lake/Lake Menomin (TL/LM) Total Maximum Daily Load (TMDL). The Waste Load Allocation (WLA) for the Village of Dallas (Dallas) is 231 lbs/yr. This equates to 1.2 lbs/day as a monthly average (or 1.9 mg/L). During the previous permit term, Dallas evaluated their compliance options and determined that a facility upgrade is needed, including the installation of a chemical phosphorus removal system, in order to meet the concentration and mass limits for phosphorus. Based on NR 102.06, Wis. Adm. Code, the interim effluent limit is 3.5 mg/L as a monthly average.

J. List of all who assisted in the compilation of data for this form

Name	Email	Phone	Contribution
Sheri Snowbank	Sheri.Snowbank@wisconsin.gov	715-635-4131	Permit Drafter
Carson Johnson	N/A – no longer with DNR	N/A	Compliance Staff
Michael Polkinghorn	Michael.Polkinghorn@wisconsin.gov	715-360-3379	Limits Calculator
Sarah Donoughe	Sarah.Donoughe@wisconsin.gov	920-366-6076	Variance Coordinator

Section II: Criteria and Variance Information

A. Water Quality Standard from which variance is sought: 0.075 mg/L Phosphorus WQC

B. List other criteria likely to be affected by variance: None.

C. Source of Substance:

Dallas discharges to Upper Pine Creek within the Pine Creek and Red Cedar River Watershed. According to the Pollutant Load Ratio Estimation Tool (PRESTO) model, 99% of the phosphorus entering the creek is coming from nonpoint sources and natural background conditions. The Village contributes the remaining 1% originating from point sources. The Village of Dallas is the only wastewater discharge to Upper Pine Creek.

Citation: PRESTO is a statewide GIS-based tool that compares the average annual phosphorus loads originating from point and nonpoint sources within a watershed. More information about this model is available at http://dnr.wi.gov/topic/surfacewater/presto.html.

D. Ambient Substance Concentration: 38 ug/L ☒ **Measured** ☐ **Estimated** ☐ **Default** ☐ **Unknown**

E. If measured or estimated, what was the basis? Include citation.

There isn't available data for Upper Pine Creek; instead, comparable data from the nearby South Fork of the Hay River was used. The ambient concentration used is the same as the last permit term (38 ug/L). It is based on the median value of seven samples collected between 2003 and 2011 during the months April through December.

Citation: Effluent Limit Recommendations memo, dated August 7, 2012

F. Average effluent discharge rate: 0.041 MGD (October 2019 – January 2025) **Maximum effluent discharge rate:** 0.076 MGD (annual average design flow rate)

G. Effluent Substance Concentration: 1-day P99: 4.61 mg/L
4-day P99: 3.47 mg/L
30-day P99: 2.86 mg/L
(November 2021 – January 2025)

☒ **Measured** ☐ **Estimated** ☐ **Default** ☐ **Unknown**

H. If measured or estimated, what was the basis? Include Citation. Effluent data reported during the current permit term.

I. Type of HAC:

☐ **Type 1: HAC reflects waterbody/receiving water conditions**
☒ **Type 2: HAC reflects achievable effluent conditions**
☐ **Type 3: HAC reflects current effluent conditions**

J. Statement of HAC:

The Department has determined the highest attainable condition of the receiving water is achieved through the application of the variance limit in the permit, combined with a permit requirement to upgrade the existing treatment plant to include traditional phosphorus removal and optimization of the new system. Thus, the HAC at commencement of this variance is 3.5 mg/L and during the permit term the HAC will be 1.0 mg/L (during the months of October-June), which reflects the greatest phosphorus reduction achievable with the proposed upgraded treatment processes. These optimization measures are to continue after facility upgrade and annual reports documenting on-going reduction and optimization of phosphorus control are required through the remainder of the permit term. The current effluent condition is reflective of on-site optimization measures that have already occurred and an interim limit of 3.5 mg/L has been included in the proposed permit until the permittee can complete plant upgrades and meet the variance interim limit of 1.0 mg/L (beginning October 1, 2030); the interim limit of 3.5 mg/L will also apply during the months of July-September. This HAC determination is based on the economic feasibility of available compliance options for Dallas at this time (see Economic Section below). The permittee may seek to renew this variance in the subsequent reissuance of this permit; the Department will reevaluate the HAC in its review of such a request. A subsequent HAC cannot be defined as less stringent than this HAC.

K. Variance Limit: 3.5 mg/L as a monthly average; 1.0 mg/L as a monthly average during the months of October-June (beginning October 1, 2030)

L. Level currently achievable (LCA): 3.5 mg/L as a monthly average

M. What data were used to calculate the LCA, and how was the LCA derived? (*Immediate compliance with LCA is required.)*

Based upon 218 effluent data points from November 2021 – January 2025. The interim monthly average phosphorus limit of 3.5 mg/L is consistent with the 4-day P99 value from November 2021 through January 2025.

N. Explain the basis used to determine the variance limit (which must be ≤ LCA). Include citation.

The variance limit is set at the interim limit of 3.5 mg/L. The variance limit is set at the concentration the permittee can meet without investing in additional treatment while allowing for operational flexibility. This is consistent with the limits expressed in s. NR 217.17, Wis. Adm. Code, and this averaging period is consistent with the limit expression in accordance with s. NR 217.14(2), Wis. Adm. Code.

Citation: Water Quality-Based Effluent Limitations for the Village of Dallas, dated March 25, 2025

O. Select all factors applicable as the basis for the variance provided under 40 CFR 131.10(g). Summarize justification below: ☐ **1** ☐ **2** ☐ **3** ☐ **4** ☐ **5** ☒ **6**

The Village of Dallas has been successful in reducing effluent phosphorus concentrations over the past five years through treatment optimization. It is believed that Dallas can maintain these successes and can take additional actions to lower phosphorus concentrations discharged by installing traditional phosphorus treatment and optimization of that system. Additionally, technology options may improve over the permit term, and will continue to be explored, as well as water quality trading. Dallas has demonstrated that the current compliance options are economically infeasible at this time. Given the long-

term effects of phosphorus pollution, an interim monthly average limit of 1.0 mg/L (during the months of October-June) will become effective once the traditional phosphorus treatment technology has been installed.

Section III: Location Information

A. Counties in which water quality is potentially impacted: Barron

B. Receiving waterbody at discharge point: Upper Pine Creek in the Pine Creek and Red Cedar River Watershed within the Lower Chippewa River Basin

C. Flows into which stream/river? Red Cedar River **How many miles downstream?** Approx. 6 miles

D. Coordinates of discharge point (UTM or Lat/Long): X= 377159.25, Y= 531746.56

E. What are the designated uses associated with this waterbody?
Upper Pine Creek is designated as Cold Water (CW) community, non-public water supply, within Ceded Territory (wild rice has not been recorded). The entire watershed is included in the Tainter Lake and Lake Menomin Total Maximum Daily Load (TMDL).

F. Describe downstream waters:
Upper Pine Creek discharges to the Red Cedar River. The Red Cedar is classified as Fish and Aquatic Life (FAL), Warm Water Sport Fishery (WWSF) for its entire length (ending in the Chippewa River). The Red Cedar River is also listed as a 303(d) water and considered impaired for total phosphorus. The entire watershed is included in the Tainter Lake and Lake Menomin TMDL.

G. What is the distance from the point of discharge to the point downstream where the concentration of the substance falls to less than or equal to the applicable criterion of the substance?
N/A – the downstream water exceeds Wisconsin's water quality criteria.

H. Provide the equation used to calculate that distance.
N/A

I. Identify all other variance permittees for the same substance which discharge to the same stream, river, or waterbody in a location where the effects of the combined variances would have an additive effect on the waterbody:
There are no other permittees that discharge to Upper Pine Creek that have a phosphorus variance. See the map "Dallas - Outfall Location (no other variances)."

Please attach a map, photographs, or a simple schematic showing the location of the discharge point as well as all variances for the substance currently draining to this waterbody on a separate sheet.

J. Is the receiving waterbody on the CWA 303(d) list? If yes, please list the impairments below. ☒ **Yes** ☐ **No** ☐ **Unknown**

River Mile	Pollutant	Impairment
2.32 – 11.32 *(Upper Pine Creek)*	Total Phosphorus	Water Quality Use Restrictions

Section IV: Pretreatment (complete this section only for POTWs with DNR-Approved Pretreatment Programs. See w:\Variances\Templates and Guidance\Pretreatment Programs.docx)

A. Are there any industrial users contributing phosphorus to the POTW? If so, please list.
N/A

B. Are all industrial users in compliance with local pretreatment limits for phosphorus? If not, please include a list of industrial users that are not complying with local limits and include any relevant correspondence between the POTW and the industry (NOVs, industrial SRM updates and timeframe, etc)
N/A

C. When were local pretreatment limits for phosphorus last calculated?
N/A

D. Please provide information on specific SRM activities that will be implemented during the permit term to reduce the industry's discharge of the variance pollutant to the POTW
N/A

Section V: Public Notice

A. Has a public notice been given for this proposed variance? ☒ Yes ☐ No

B. If yes, was a public hearing held as well? ☒ Yes ☐ No ☐ N/A

C. What type of notice was given?
☒ **Notice of variance included in notice for permit** ☐ **Separate notice of variance**

D. Date of public notice: TBD (Sept/Oct 2025) **Date of hearing:** November 25, 2025

E. Were comments received from the public in regards to this notice or hearing? ☐ Yes ☐ No
(If yes, please attach on a separate sheet)

Section VI: Human Health

A. Is the receiving water designated as a Public Water Supply? ☐ Yes ☒ No

B. Applicable criteria affected by variance: N/A

C. Identify any expected impacts that the variance may have upon human health, and include any citations: None.

Section VII: Aquatic Life and Environmental Impact

A. Aquatic life use designation of receiving water: Cold Water (CW) community, non-public water supply

B. Applicable criteria affected by variance: 75 ug/L (0.075 mg/L), Fish and Aquatic Life Criteria

C. Identify any environmental impacts to aquatic life expected to occur with this variance, and include any citations:
According to the Pollutant Load Ratio Estimation Tool (PRESTO) model, 98% of the phosphorus in the 22.1 square mile watershed area is attributable to nonpoint sources. The total annual average nonpoint phosphorus loading is 18,667 lbs/year. The Village of Dallas' average annual phosphorus loading between 2009 and 2011 was 316 lbs/year. (See PRESTO report). While increased phosphorus removal from the point source is beneficial to the watershed health, it is not overwhelmingly going to lead to restoration.

Citation: PRESTO - http://dnr.wi.gov/topic/surfacewater/presto.html

D. List any Endangered or Threatened species known or likely to occur within the affected area, and include any citations:
The following list contains the Federally Endangered, Threatened, Proposed, and Candidate Species in Barron County, Wisconsin From U.S. Fish and Wildlife Service, Region 3, August 2025.

BIRDS
Piping Clover (E)
CLAMS
Higgins Eye (E)
Sheepnose Mussel (E)
Snuffbox Mussel (E)
Spectaclecase (mussel) (E)
Winged Mapleleaf (E)
MAMMALS
Indiana bat (E)
Norther Long-eared Bat (E)
REPTILES
Eastern Massasauga (T)
SNAILS
Iowa Pleistocene snail (E)
INSECTS
Hine's emerald dragonfly (E)
Karner Blue Butterfly (E)
Poweshiek skipperling (E)
Rusty Patched Bumble Bee (E)
FLOWERING PLANTS

Dwarf lake iris (T)
Eastern prairie fringed orchid (T)
Fassett's locoweed (T)
Mead's Milkweed (T)
Northern wild monkswood (T)
Pitcher's thistle (T)
Prairie Bush Clover (T)

Citation: U.S. Fish & Wildlife Service – Environmental Conservation Online System (http://www.fws.gov/endangered/) and National Heritage Index (http://dnr.wi.gov/topic/nhi/)

Section VIII: Economic Impact and Feasibility

A. Describe the permittee's current pollutant control technologies (treatment processes):
The Village of Dallas wastewater treatment facility serves a population of approximately 358 with no significant industrial contributors. The annual average design flow is 76,000 gallons per day with actual flows averaging 50,000 gallons per day (2020-2024). Treatment consists of two aerated ponds operated one after another (in series). Within these ponds naturally occurring bacteria and organisms already present in the wastewater metabolize organic matter. The treated wastewater (effluent) is disinfected by ultraviolet lights seasonally (May 1 through September 31 annually) before being discharged to the Upper Pine Creek in Barron County.

B. What modifications would be necessary to comply with the current limits? List additional treatment processes and/or technologies available. Include any citations.
During the current permit term, Dallas pilot tested chemical phosphorus removal because it was identified as the most feasible alternative to remove phosphorus. Over the duration of the pilot test, effluent phosphorus concentrations reached levels at or below the TMDL WLA concentration; however, a significant drop in pH was also observed during that time (during the summer months). The proposed permit includes varying interim limits depending on the season. It also includes requirements for a wastewater treatment plant upgrade and optimization.

Water quality trading (WQT) was initially deemed to be economically infeasible but following the upgrade/optimization required in the proposed permit, WQT may now be feasible when used in conjunction with the upgrade/optimization.

Citation: See the Abbreviated Wastewater Facility Plan – *Final Phosphorus Report* (dated January 2025)

C. Identify any expected environmental impacts that would result from further treatment, and include any citations:
N/A

D. Is it technically and economically feasible for this permittee to modify the treatment process to comply with the water quality-based limits? ☐ **Yes** ☒ **No**

E. If treatment is possible, is it possible to comply with the limits on the substance? ☒ **Yes** ☐ **No**

F. If yes, what prevents this from being done? Include any citations.
All evaluated compliance options are economically infeasible at this time because the cost would result in a user rate in excess of 2%.

Citation: See the Economic Justification - Updated Alternatives Analysis "MDV Economic Evaluation Worksheet"

G. List any alternatives to current practices that have been considered, and why they have been rejected as a course of action, including any citations:
During the previous permit term, Dallas evaluated chemical phosphorus removal with a continuous discharge, chemical phosphorus removal with a seasonal discharge, water quality trading (WQT), an alternative discharge location, and land disposal. All were rejected because they are not economically feasible. However, during the proposed permit term it was deemed feasible to initiate a plant upgrade/optimization in conjunction with WQT.

H. Describe the economic impacts of compliance:

Economic Factor		Source
MHI	$54,167	Phosphorus Variance Application for Municipal Facilities
Calculated preliminary screener	2.02%	Dallas Economic Justification - Updated Alternatives Analysis
Secondary score value	N/A	N/A

Section IX: Multi-Discharger Variance Feasibility *(this assumes MDV approval)*

A. Does the facility meet the economic indicators to qualify for the MDV? ☒ **Yes** ☐ **No** ☐ **Unknown**

MDV secondary indicator score: N/A

B. Is it technically and economically feasible for this permittee to comply with a phosphorus WQBEL of 1 mg/L or lower? ☐ **Yes** ☒ **No** ☐ **Unknown**

C. Justification for considering an individual variance in lieu of the MDV: The cost of a plant upgrade to meet 1 mg/L, combined with the county payments about the target value, would increase the residential user rates to >2% of the MHI.

Section X: Compliance with Water Quality Standards

A. Describe all activities that have been, and are being, conducted to reduce the discharge of the substance into the receiving stream. This may include existing treatments and controls, consumer education, promising centralized or remote treatment technologies, planned research, etc. Include any citations.

An inventory was completed to identify the sources of phosphorus to the treatment facility.

During this previous permit term, the Village of Dallas WWTF responsibilities included:

- Reduce I/I to sanitary collection system through CMOM initiatives
- Monitor pond sludge depths and remove as appropriate
- Investigate and correct influent and effluent flow discrepancies
- Evaluate and address other plant maintenance items
- Discuss watershed projects with Barron County Land Conservation Department
- Continue to evaluate potential partners for phosphorus watershed reductions
- Conduct a full-scale chemical pilot addition project

Citation: Abbreviated Wastewater Facility Plan (Final Phosphorus Report), Village of Dallas, Barron County, Wisconsin, dated January 9, 2025

B. Describe all actions that the permit requires the permittee to complete during the variance period to ensure reasonable progress towards attainment of the water quality standard. Include any citations.

This proposed permit contains a variance to the water quality-based effluent limit (WQBEL) for phosphorus approved in accordance with s. 283.15, Wis. Stats. As conditions of this variance the permittee is required to: (a) Maintain effluent quality at or below the interim effluent phosphorus limitations specified in the permit in accordance with the scheduled compliance date; (b) Submit a report on reductions and optimizing control of phosphorus 6 months prior to permit expiration; and (c) Perform the actions listed in Section 4.1 of the permit (see the Schedules section of the Permit).

Citation: See also, Proposed Permit Section 2.2.1.3, Phosphorus Variance – Wastewater Treatment Plant Upgrade to Meet 1.0 mg/L Interim Limit

Section XI: Compliance with Previous Permit *(Variance Reissuances Only)*

A. Date of previous submittal: August 14, 2019 **Date of EPA Approval:** September 24, 2019

B. Previous Permit #: WI-0023698-09-0 **Previous WQSTS #:** (EPA USE ONLY)

C. Effluent substance concentration: 3.47 mg/L (4-day P99) **Variance Limit:** 3.64 mg/L (monthly average)

D. Target Value(s): N/A **Achieved?** ☐ **Yes** ☐ **No** ☒ **Partial**

E. For renewals, list previous steps that were to be completed. Show whether these steps have been completed in compliance with the terms of the previous variance permit. Attach additional sheets if necessary.	
Condition of Previous Variance	**Compliance**
1. Reducing Influent Sources	**Note 1: A new CMOM was completed in 2024.**
a. CMOM Annual audits/goals	☐ **Yes** ☒ **No**
b. If determined feasible, develop and implement options.	☐ **Yes** ☒ **No**
2. Reducing Effluent TP Concentrations and loadings	**Note 2: There's no record on file of these specific actions. Sludge sampling was completed as part of the NON/NOV enforcement follow-up actions; but, there is no record of Dallas evaluating sludge depth or removal.**
a. Monitor Sludge Depths	☐ **Yes** ☒ **No**
b. Evaluate need for sludge removal and submit results in annual PMP	☐ **Yes** ☒ **No**
c. If feasible, develop sludge removal plan and implement.	☐ **Yes** ☒ **No**
d. Investigate and correct flow discrepancies	☐ **Yes** ☒ **No**
e. Evaluate other treatment plant maintenance needs	☐ **Yes** ☒ **No**
f. If determined feasible, develop and implement options.	☐ **Yes** ☒ **No**
3. Full Scale Pilot Project	**Note 3: The pilot project was completed July-October 2020.**
a. Submit scope of full-scale summer pilot project for approval to DNR	☒ **Yes** ☐ **No**
b. Initiate and conduct project	☒ **Yes** ☐ **No**
c. Complete write up of project for inclusion in Final P Progress Report	☒ **Yes** ☐ **No**
4. Watershed Reduction Program	**Note 4: Dallas contacted the WQT Clearinghouse; there are some potential trades. They did not pursue trades further.**
a. Meet with Barron County land conservation department to identify possible projects such as agricultural conservation practices, urban stormwater improvements, and stream bank stabilization.	☒ **Yes** ☐ **No**
b. If determined feasible, develop trading plan and implement options	☐ **Yes** ☒ **No**