Permit Fact Sheet

General Information

Permit Number	WI-0021482-11-0
Permittee Name and Address	Village of Luck P.O. Box 315 401 Main Street Luck, WI 54853
Permitted Facility Name and Address	Village of Luck 260th Avenue, Luck, Wisconsin
Permit Term	February 01, 2026, to December 31, 2030
Discharge Location	The surface water outfall consists of six discharge points located in the 34-acre wetland immediately west of the facility. Groundwater discharge via three seepage cells located north of the aerated lagoons (NE¼, SW ¼ section 21; T36N-R17W)
Receiving Water	Unnamed wetland drains to North Star Creek located to the north, which is tributary to the South Fork of the Trade River, located in the Trade River watershed. Groundwater via seepage cells in the Trade River watershed of St Croix River basin in Polk County
Stream Flow ($Q_{7,10}$)	0.0 cfs for the wetland complex
Stream Classification	Limited aquatic life (LAL) community and effluent ditch from treatment plant to the center of Section 21. Approximately 0.5 miles from the outfall, North Star Creek is a cold-water sport fish (CWSF) community and Class 2 trout stream. Both waterbodies are within the ceded territory, and neither are public water supplies.
Discharge Type	Existing seasonal (surface water approximately 6 months a year and groundwater for the remaining 6 months).
Annual Average Design Flow (MGD)	0.171 MGD
Industrial or Commercial Contributors	None
Plant Classification	A2 - Attached Growth Processes; A4 - Ponds, Lagoons and Natural Systems; P - Total Phosphorus; N - Total Nitrogen; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Luck owns and operates a domestic wastewater treatment system. The system is designed to treat 171,000 gallons per day and currently treats an average of 146,000 gallons per day (2020-2025 data). The treatment system consists of two aerated ponds and between the ponds a moving bed biofilm reactor (MBBR) and chemical addition to aid phosphorus removal. Naturally occurring bacteria already in the ponds and on the biofilm carriers within the MBBR metabolize organic matter in the wastewater.

The treated water (effluent) can be discharged to an adjacent wetland complex (approximately 34 acres in size) or to three seepage cells. The Village discharges primarily to the wetland May through September and to the seepage cells November through April. There are five monitoring wells located around the treatment facility to assess any groundwater impacts of the discharge.

Substantial Compliance Determination

There have been some violations of effluent limits, late reporting, and CMOM management issues. However, the violations have either already been resolved or are expected to be resolved due to ongoing efforts. Stepped enforcement will continue to be used to address those violations if necessary.

After a review of all Discharge Monitoring Reports, Groundwater Monitoring Reports, Land Application Reports, CMARs, and a site visit on 06/03/2025, by Carson Johnson, WDNR, the Village of Luck has been found to be in substantial compliance with their current permit.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	INFLUENT An average of 0.134 MGD (June 2020 – July 2025 data)	Representative influent samples shall be collected in the wet well at the main lift station on 115 3rd Avenue.
001	DISCHARGE TO Groundwater An average of 0.133 MGD during periods of discharge. Discharges occur over the six cold weather months.	Representative samples shall be collected at the control structure prior to discharge to the seepage cells.
002	DISCHARGE TO Surface Water An average of 0.158 MGD during periods of discharge. Discharges occur over the six warm weather months.	Representative samples shall be collected in the main control building prior to discharge to the unnamed wetland.
004	SLUDGE Removal of sludge last occurred in 2017.	Representative samples shall be collected from the accumulated sludge in the lagoons at various locations and depths that are composited for analysis.

Sample Point Designation For Groundwater Monitoring Systems	
Sample Pt Number & Well Name	**Comments**
803 (MW803)	Side gradient non-point of standard well located northwest of the seepage cells.
805 (MW805)	Upgradient well used to measure background groundwater quality, evaluate and calculate PALs. The well is located south of the aerated lagoons.
807 (MW807)	Down gradient point of standard well located west of the seepage cells and aerated lagoons.
810 (MW 810)	Down gradient point of standard well located west of the seepage cells.

Sample Point Designation For Groundwater Monitoring Systems	
Sample Pt Number & Well Name	**Comments**
811 (MW 811)	Down gradient point of standard well located west of the seepage cells.

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	Measured by a Magnetic flow meter.
BOD5, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Weekly	24-Hr Flow Prop Comp	
Nitrogen, Total Kjeldahl		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	Organic Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) - Ammonia Nitrogen (mg/L)
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	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 **Flow Rate** sample frequency was 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 and to assess loading to the facility and land treatment performance. The required parameters and sampling frequency are appropriate for a surface water and land treatment system as outlined in chs. NR 210 and 206, Wis. Adm Code.

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 002- DISCHARGE TO WETLAND

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate	Daily Max	0.364 MGD	Daily	Continuous	Measured by a Magnetic flow meter.
BOD5, Total	Monthly Avg	20 mg/L	Weekly	24-Hr Flow Prop Comp	
BOD5, Total	Weekly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	Weekly	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	Weekly	24-Hr Flow Prop Comp	
pH Field	Daily Max	9.0 su	Weekly	Grab	
pH Field	Daily Min	6.0 su	Weekly	Grab	
Dissolved Oxygen	Daily Min	4.0 mg/L	Weekly	Grab	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	9.6 mg/L	Weekly	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Weekly	24-Hr Flow Prop Comp	Enter the daily ammonia result on the eDMR and compare it to the Nitrogen, Ammonia Variable Limit column to determine compliance.
Nitrogen, Ammonia Variable Limit		mg/L	Weekly	See Table	Using the daily pH result look up the applicable ammonia limit using the table in the Ammonia Limitation permit section and report the variable limit on the eDMR.
E. coli		#/100 ml	Weekly	Grab	Monitoring is required May through September 2026.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule. See the permit E. coli Percent Limit section. Enter the result in the DMR on the last day of the month
Chlorine, Total Residual	Daily Max	19 ug/L	5/Week	Grab	If the permittee chooses to use chlorination for disinfection, monitoring and limit will begin at the end of the Effluent Limitations for E. coli Schedule.
Chloride		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitor only during quarters in which a surface water discharge occurs.
Phosphorus, Total	Monthly Avg	0.8 mg/L	Weekly	Grab	This is an interim MDV limit. See the MDV permit sections and phosphorus schedules.
Phosphorus, Total	Monthly Avg	5.8 lbs/day	Weekly	Calculated	See the TMDL Phosphorus permit section for more information.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the total monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See the permit Standard Requirements section for 'Appropriate Formulas' to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Annual	Calculated	Report the sum of the total monthly discharges for the calendar year on the Annual report form.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	See the Nitrogen Series Monitoring permit section for testing schedule.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	See the Nitrogen Series Monitoring permit section 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 the Nitrogen Series Monitoring permit section for testing schedule.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Two tests are required during the permit term. See the Whole Effluent Toxicity (WET) testing permit section for monitoring schedule.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Two tests are required during the permit term. See the Whole Effluent Toxicity (WET) testing permit section for monitoring 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 **Flow Rate** sample frequency was changed from "Continuous" to "Daily" to reflect currently acceptable practices at the facility.
- Seasonal **Escherichia coli** (E. coli) monitoring and limits are required at the end of the Effluent Limitations for E. coli schedule.
- If chlorination is chosen as the disinfection method, seasonal **Chlorine** monitoring and limits will begin at the end of the Effluent Limitations for E. coli Schedule.
- **Chloride** monitoring has been added to provide information for the next permit reissuance.
- The permittee has applied for a **multi-discharger variance** (MDV) for phosphorus for this permit term and the application has been approved by the Department. An MDV interim limit of 0.8 mg/L has been added that goes into effect per a compliance schedule. The permittee is now required to report the total amount of phosphorus discharged in lbs/month and lbs/year. By March 1 of each year the permittee shall make a payment(s) to participating county(s) of $66.62 per pound of phosphorus discharged during the previous year in excess of the target value of 0.2 mg/L.
- Two **Acute** and **Chronic WET** tests are required during the permit term.

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 October 27, 2025.

Disinfection & E. coli: Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying E. coli WPDES permit implementation procedures became effective May 1, 2020.

Section NR 102.04(5)(a), Wis. Adm. Code, states that all surface waters shall be suitable for recreational use and meet the E. coli criteria established to protect this use. Section NR 102.04(5)(b), Wis. Adm. Code, states that exceptions to the disinfection requirement can be made if the department determines, in accordance with the procedures specified in s. NR 210.06(3), Wis. Adm. Code, that disinfection is not required to meet water quality criteria. As part of the reissuance process, the requirements for disinfection were reviewed under s. NR 210.06(3), Wis. Adm. Code.

It was determined that the permittee is required to disinfect, during the following months May – September. See the WQBEL report for further explanation.

Phosphorus – Phosphorus rules became effective December 1, 2010 per NR 217, Wis. Adm. Code, that required the permittee to comply with water quality based effluent limits (WQBELs) for total phosphorous. The final phosphorus WQBELs are 0.225 mg/L (monthly average) and 0.075 mg/L (six-month average) and were to become effective as scheduled unless a variance was granted. For this permit term, the permittee has applied for the Multi-Discharger Variance (MDV) for phosphorus as provided for in s. 283.16, Wis. Stats., and approved by USEPA on February 6, 2017 for a 10-year duration. The permittee qualifies for the MDV because it is an existing source and a major facility upgrade is needed to comply with the applicable phosphorus WQBELs, thereby creating a financial burden. The interim effluent limit for total phosphorus is 0.8 mg/L as an average monthly limit.

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

The "price per pound" value is $50.00 adjusted for CPI annually during the first quarter as defined by s. 283.16(8)(a)2, Wis. Stats and takes effect for reissued permits with effective dates starting April 1. This may differ from the "price per pound" that is public noticed as listed above; however, the "price per pound" is set upon reissuance and is applicable for the entire permit term. The participating county(s) uses these payments to implement non-point source phosphorus control strategies at the watershed level.

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 monitoring frequencies for pH and ammonia fall below the standard monitoring frequency outlined in guidance. Since 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, the reduced monitoring frequency is continued in the proposed permit. 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 Treatment – Monitoring and Limitations

3.1 Sample Point Number: 001- DISCHARGE TO GROUND WATER

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
CBOD5	Monthly Avg	45 mg/L	2/Month	Grab	
Suspended Solids, Total		mg/L	2/Month	Grab	
Solids, Total Dissolved		mg/L	Monthly	Grab	
pH Field		su	2/Month	Grab	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Monthly	Grab	
Nitrogen, Nitrite + Nitrate Total		mg/L	Monthly	Grab	
Nitrogen, Total		mg/L	Monthly	Calculated	Total Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) + [Nitrite + Nitrate] Nitrogen (mg/L)
Nitrogen, Organic Total		mg/L	Monthly	Calculated	Organic Nitrogen (mg/L) = Total Kjeldahl Nitrogen (mg/L) - Ammonia Nitrogen (mg/L)
Chloride		mg/L	Monthly	Grab	

Changes from Previous Permit:

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

Explanation of Limits and Monitoring Requirements

All requirements for land treatment of municipal wastewater are determined in accordance with ch. NR 206, Wis. Adm. Code. All categorical limits are based on s. NR 206.08(1) Wis. Adm. Code. More information on the limitations can be found in the Groundwater Evaluation for Village of Luck dated October 31, 2025.

4 Groundwater – Monitoring and Limitations

4.1 Groundwater Monitoring System for Seepage Cell

Location of Monitoring system: Around the treatment system

Groundwater Monitoring Well(s) to be Sampled: MW803, MW805, MW807, MW 810, MW 811

Groundwater Monitoring Well(s) Used to Evaluate Background Groundwater Quality: MW805

Groundwater Monitoring Well(s) Used for Point of Standards Application: MW807, MW 810, MW 811

Parameter	Units	Preventative Action Limit	Enforcement Standard	Frequency
Depth To Groundwater	feet	N/A	N/A	Quarterly
Groundwater Elevation	feet MSL	N/A	N/A	Quarterly
Nitrogen, Nitrite + Nitrate (as N) Dissolved	mg/L	2.0	10	Quarterly
Chloride Dissolved	mg/L	125	250	Quarterly
pH Field	su	7.8	N/A	Quarterly
Nitrogen, Total Kjeldahl Dissolved	mg/L	N/A	N/A	Quarterly
Nitrogen, Ammonia Dissolved	mg/L	0.97	9.7	Quarterly
Nitrogen, Organic Dissolved	mg/L	2.6	N/A	Quarterly
Solids, Total Dissolved	mg/L	325	N/A	Quarterly

Changes from Previous Permit:

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

Parameter	Permit Issuance - 10		Permit Issuance - 11	
	Preventive Action Limit	Enforcement Standard	Preventive Action Limit	Enforcement Standard
pH, field	5.6 - 7.6 s.u.	N/A	5.8 – 7.8 s.u.	N/A
Nitrogen, Organic	2.3 mg/L	N/A	2.6 mg/L	N/A
Total Dissolved Solids	320 mg/L	N/A	320 mg/L	N/A

Explanation of Limits and Monitoring Requirements

Groundwater limits and requirements are determined in accordance with ch. NR 140, Wis. Adm. Code. Indicator parameter Preventive Action Limit (PAL) values are established per s. NR 140.20, Wis. Adm. Code.

For more information, please refer to the Groundwater Evaluation for Village of Luck dated October 31, 2025.

5 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)**
004	B	Liquid	Sludge was last removed in 2017, 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 of samples (2020) are below the level of detection.						
Is a priority pollutant scan required? No						

5.1 Sample Point Number: 004- SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
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), **PCBs** and **PFAS** monitoring is required during the second year of the permit term (2027).
- Because it's recommended that **List 2** (Nutrients) are monitored with the List 1 monitoring, they have been added to the table.
- Due to changes within the land application forms, the 3400-049 ("Characteristics Report"), 3400-052 ("Other Methods of Disposal") and 3400-055 (Annual Land Application") will need to be submitted each year.

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).

List 2 Nutrient monitoring – Monitoring for list 2 (nutrients) is highly recommended at the same time as the monitoring of List 1 (metals) in year 2 of the permit (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).

PCB monitoring – In preparation for the next land application event PCBs concentrations are needed prior to land application, NR 204.07 Wis. Adm. Code.

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

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

Change in form submittal – In prior permit reissuances when it has been noted in the application that sludge would not be removed during the permit term, the department required sampling during the second year of the permit term and the sludge characteristic report (3400-049) would be generated only during that year. Due to moving to electronic submittal of forms via Switchboard, forms 3400-049 ("Characteristics Report"), 3400-052 ("Other Methods of Disposal") and 3400-055 ("Annual Land Application") will now be generated by the department and the permittee will be required to submit all three reports each year of the permit term. This change was adopted to provide the permittee flexibility because many lagoon desludging projects can be unexpected, are delayed or staggered over multiple years. Additionally, it is used to officially report that no land application of sludge has occurred, and annual submittal of the forms is required per the standard requirements section.

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

6 Schedules

6.1 Effluent Limitations for E. coli

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

Required Action	Due Date
Status Update: The permittee shall submit information within the discharge monitoring report (DMR) comment section documenting the steps taken in preparation for properly monitoring and testing for	03/21/2026

E. coli including, but not limited to, selected test method and location of sampling.	
Report on Effluent Discharge: The permittee shall prepare and submit a report on effluent discharge. The report shall include an evaluation of collected effluent data and the facility's ability to comply with final E. coli limitations. The report shall state whether current treatment results in compliance with the final E. coli limitations. The permittee shall also submit a request to the department to evaluate the need for disinfection pursuant s. NR 210.06(3), Wis. Adm. Code. MODIFICATION - If the department determines, based on the information submitted in the Report on Effluent Discharges, that disinfection is not required pursuant s. NR 210.06(3), Wis. Adm. Code, the department will modify or revoke and reissue the permit in accordance with public notice procedures under ch. 283, Wis. Stats., and ch. NR 203, Wis. Adm. Code, to remove monitoring, the final E. coli limitation, and the remaining actions in this schedule of compliance. FACILITY PLAN - If the Report on Effluent Discharge concludes that current treatment does not results in compliance with the final E. coli limitations, the permittee shall initiate development of a facility plan for meeting final E. coli limitations and comply with the remaining required actions in this schedule of compliance.	11/30/2026
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2027
Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to achieve compliance with final E. coli limitations and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2028
Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	09/30/2028
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2029
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2030
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	04/30/2030

Explanation of Schedule

E. coli - A compliance schedule is included in the permit to provide time for the permittee to investigate options for meeting new effluent E. coli water quality-based effluent limits while coming into compliance with the limits as soon as reasonably possible.

6.2 Phosphorus Schedule - Continued Optimization

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

Required Action	Due Date
Optimization: The permittee shall continue to implement the optimization plan as previously approved to optimize performance to control phosphorus discharges. Submit a progress report on optimizing removal of phosphorus by the Due Date.	12/31/2026
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	12/31/2027
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	12/31/2028
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	12/31/2029
Progress Report #5: Submit a progress report on optimizing removal of phosphorus.	12/31/2030

Explanation of Schedule

Phosphorus Schedule – Continued Optimization- Per s. 283.16(6)(a), Wis. Stats,. the Department may include a requirement that the permittee optimize the performance of a point source in controlling phosphorus discharges, which may be necessary to achieve compliance with multi-discharger variance interim limits. This compliance schedule requires the permittee to continue to implement the optimization plan that was approved during the previous permit term.

6.3 Phosphorus Payment per Pound to County

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

Required Action	Due Date
Annual Verification of Phosphorus Payment to County: The permittee shall make a total payment to the participating county or counties approved by the Department by March 1 of each calendar year. The amount due is equal to the following: [(lbs of phosphorus discharged minus the permittee's target value) times ($66.62 per pound)] or $640,000, whichever is less. See the payment calculation steps in the Surface Water section. The permittee shall submit Form 3200-151 to the Department by March 1 of each calendar year indicating total amount remitted to the participating counties to verify that the correct payment was made. The first payment verification form is due by the specified Due Date. Note: The applicable Target Value is 0.2 mg/L as defined by s. 283.16(1)(h), Wis. Stats. The "per pound" value is $50.00 adjusted for CPI.	03/01/2026
Annual Verification of Payment #2: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2027
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2028
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2029
Annual Verification of Payment #5: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/01/2030

Continued Coverage: If the permittee intends to seek a renewed variance, an application for the MDV (Multi Discharger Variance) shall be submitted as part of the application for permit reissuance in accordance with s. 283.16(4)(b), Wis. Stats.	
Annual Verification of Payment After Permit Expiration: In the event that this permit is not reissued prior to the expiration date, the permittee shall continue to submit Form 3200-151 to the Department indicating total amount remitted to the participating counties by March 1 each year.	

Explanation of Schedule

Phosphorus Payment per Pound to County - Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce non-point sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the "Payment to Counties" watershed option described in s. 283.16(8), Wis. Stats. Under this option the permittee shall make annual payment(s) to participating county(s) that are calculated based on the amount of phosphorus actually discharged during a calendar year in pounds per year less the amount of phosphorus that would have been discharged had the permittee discharged phosphorus at a target value concentration of 0.2 mg/L. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal $66.62 per pound. This schedule requires the permittee to submit Form 3200-151 to the Department indicating the total amount remitted to the participating county(s).

6.4 Land Treatment Management Plan

A management plan is required for the land treatment system.

Required Action	Due Date
Land Treatment Management Plan Submittal: Submit an update to the management plan to optimize the land treatment system performance and demonstrate compliance with ch. NR 206, Wis. Adm. Code. The land treatment system shall be operated in accordance with the approved management plan.	04/30/2026

Explanation of Schedule

Land Treatment Management Plan - An up-to-date Land Treatment Management plan is a standard requirement in reissued municipal permits per ch. NR 206, Wis. Adm. Code.

6.5 Chloride Source Reduction Measures (SRMs) for Groundwater Discharges

Required Action	Due Date
Chloride Reduction Plan: The permittee shall complete and submit for Department review and approval a chloride reduction plan (CRP). The CRP is an initial step toward controlling chloride and ensuring compliance with chloride limits based on applicable groundwater standards. The CRP shall evaluate all applicable source reduction measures (SRMs) and establish appropriate implementation activities for the SRMs. The CRP shall include a schedule for implementing the selected SRMs.	07/31/2025
Annual Progress Report: Once the chloride reduction plan (CRP) is approved by the Department, the permittee shall submit an annual progress report, under the authority of s. NR 205.07(1)(h), Wis. Adm. Code. If a SRM implementation date of an approved CRP is not met, this may constitute a violation of the permit. Submittal of the first annual progress report is required by the Date Due.	07/31/2026
Annual Progress Report #2: Submit progress report in implementing the chloride reduction plan	07/31/2027

(CRP).	
Annual Progress Report #3: Submit progress report in implementing the chloride reduction plan (CRP).	07/31/2028
Annual Progress Report #4: Submit progress report in implementing the chloride reduction plan (CRP).	07/31/2029
Annual Progress Report #5: Submit progress report in implementing the chloride reduction plan (CRP).	07/31/2030
Continued Annual Progress Report: In the event that this permit is not reissued prior to the expiration date, the permittee shall continue to submit a progress report in implementing the chloride reduction plan (CRP).	

Explanation of Schedule

Chloride Source Reduction Measures (SRMs) for Groundwater Discharges – There were several chloride exceedances in wells designated point of standard. The only way to reduce chloride concentrations in the effluent is to take action to reduce concentrations in the influent. A chloride reduction plan is required as a NR 140.24 Wis. Adm. Code response action.

6.6 Load/Rest Evaluation

Required Action	Due Date
Submit Load/Rest Data: Submit the last five years of load/rest logs to the department for evaluation.	03/01/2026

Explanation of Schedule

Load/Rest Evaluation - There were several nitrite+nitrate and chloride exceedances in the wells designated as point of standard. An evaluation of the absorption cells load/rest cycles as a NR 140.24 Wis. Adm. Code response action.

6.7 Sludge Management Plan

Required Action	Due Date
Submit a Sludge Management Plan: The permittee shall submit an update to the management plan for approval if removal of sludge will occur during this permit term. The plan shall demonstrate compliance with ch. NR 204 Wis. Adm. Code and at minimum address 1) How and where is sludge sampled; 2) Available sludge storage details and location(s); 3)How will the sludge be removed with details on volume, characterization and how will the treatment plant continue to function during the drawdown; 4) Describe the type of transportation and spreading vehicles and loading and unloading practices; 5) Identify ap-proved 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 pre-treatment processes Once approved, all sludge management activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. No desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed.	

The plan is due at least 60 days prior to desludging.	

Explanation of Schedule

If the lagoons are to be desludged during this permit term a management plan is needed to show compliance with ch NR 204, Wis. Adm. Code. There are outlines available to assist in plan development.

Attachments

Water Flow Schematic updated October 2025
Water Quality-based Effluent Limits (WQBEL) memo dated October 27, 2025
Groundwater Evaluation for Village of Luck dated October 31, 2025
MDV Application dated February 4, 2025
MDV Conditional Approval dated June 19, 2025
MDV Evaluation Checklist dated June 19, 2025

Justification Of Any Waivers From Permit Application Requirements

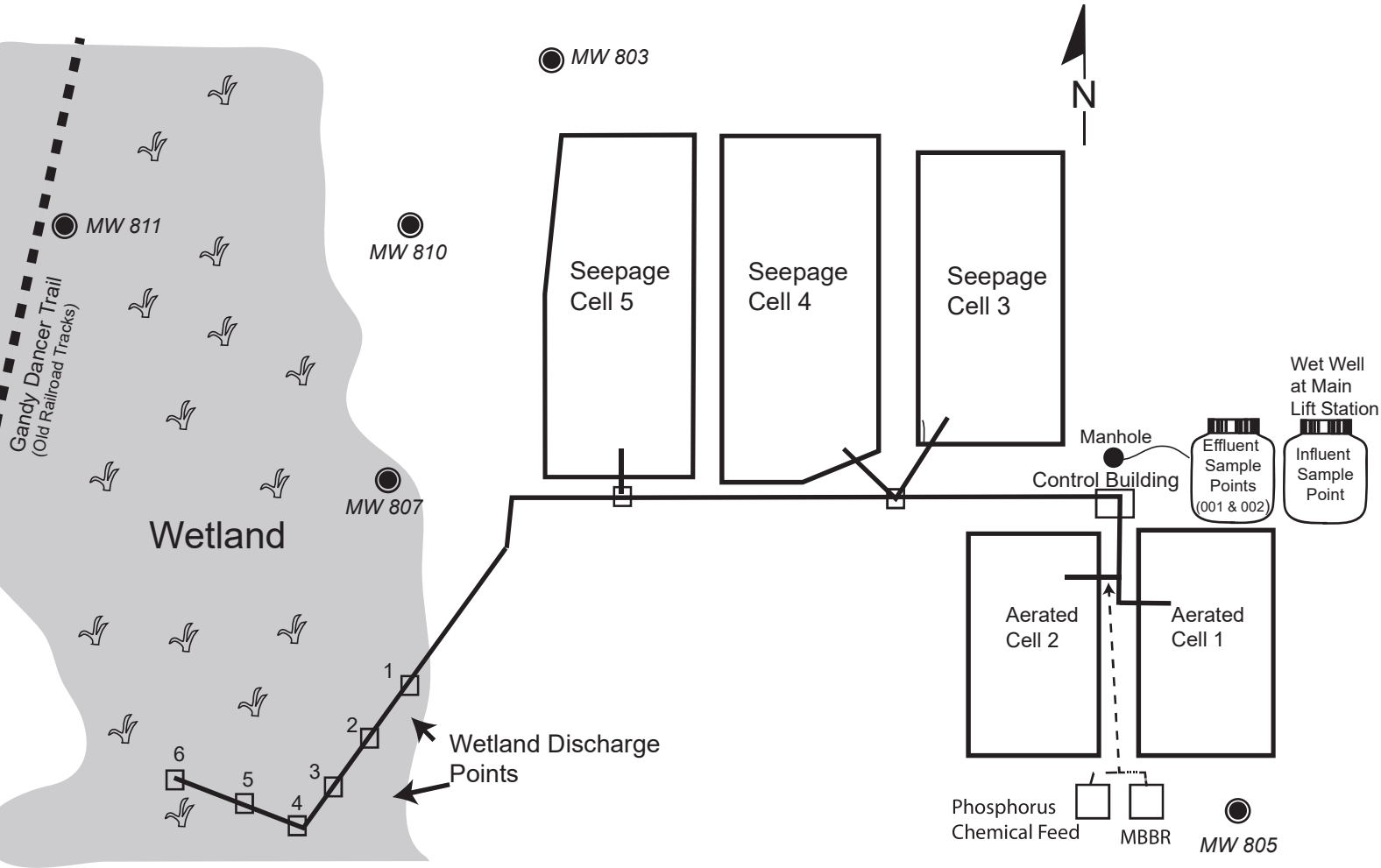
No waivers requested or granted as part of this permit reissuance

Prepared By: Sheri A. Snowbank Wastewater Specialist **Date:** October 31, 2025

WPDES Permit No. WI-0021482

Village of Luck
Wastewater Treatment Plant

The Luck wastewater treatment facility consists of two aerated ponds, moving bed biofilm reactor (MBBR), chemical addition to assist with phosphorus remival and three seepage cells. Effluent is discharged to the seepage cells, or to an unnamed wetland. The diagram below represents the treatment units and approximate sampling locations.



Design Data:
Flow: 0.171 MGD
BOD: 340 lbs/day
Suspended Solids: 388 lbs/day
Construction Yr: 1987

● represents sampling location
◉ MW# represents monitoring well locations

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 27, 2025

TO: Sheri Snowbank– Spooner/NOR

FROM: Zainah Masri – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Village of Luck
WPDES Permit No. WI-0021482-11-0

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 Luck in Polk County. This municipal wastewater treatment facility (WWTF) discharges to the Unnamed Wetland to North Star Creek located in the Trade River Watershed in the St. Croix River Basin. Lake St. Croix Basin (LSCB) Total Maximum Daily Load (TMDL) as approved by EPA on 08/08/2012. 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	0.364 MGD					1
BOD_5			30 mg/L	20 mg/L		1
TSS			30 mg/L	20 mg/L		1
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1
Ammonia Nitrogen May – October November – April	 Variable Variable		 9.6 mg/L -			2
Bacteria						
Final Limit *E. coli*				126 #/100 mL geometric mean		3
Chloride						4
Total Residual Chlorine						5
Phosphorus LCA Interim Limit HAC Interim Limit Final WQBEL TMDL Mass Limit				 1.0 mg/L 0.6 mg/L 0.225 mg/L 5.8 lbs/day	 0.075 mg/L	6,7
TKN, Nitrate+Nitrite, and Total Nitrogen						8
Acute WET						9,10,12
Chronic WET						10,11,12,13

Footnotes:

1. No changes from the current permit.

2. 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. Village of Luck shall notify the Department if the single limit or the variable limits based on effluent pH are preferred. These limits apply year-round.

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

3. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of E. coli bacteria samples collected in any calendar month may exceed 410 count/100 mL. The permit will include a compliance schedule to meet these limits.
4. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.

5. If the Village of Luck decides to upgrade to use chlorination for disinfection, effluent limitations would be recommended to assure proper operation of the de-chlorination system. A daily maximum limit of 19 µg/L would be required if the Village of Luck decides to use chlorination for disinfection**.**
6. The phosphorus mass limit is based on the Total Maximum Daily Load (TMDL) for the Lake St. Croix Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA on August 08, 2012.
7. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 1.0 mg/L should be effective upon permit reissuance. A compliance schedule may be included in the permit until the highest attainable condition (HAC) limit of 0.6 mg/L can be met. The final WQBELs remain at 0.225 mg/L as a monthly average and 0.075 mg/L as a six-month average.
8. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).
9. After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, 3 acute WET tests throughout the permit term. Sampling WET concurrently with any chemical-specific toxic substances is recommended. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests.
10. <u>If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute and chronic WET testing can be reduced to 2 tests throughout the reissued permit term.</u>

11. After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, **1 chronic WET test per year is recommended in the reissued permit.**
12. The Instream Waste Concentration (IWC) to assess chronic test results is 100 %. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5% . The primary control water used in chronic WET tests conducted on Outfall 002 shall be a grab sample collected from Unnamed wetland to North Star Creek.
13. Chronic WET testing should continue after the permit expiration date (until the permit is reissued).

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

Attachments (3) – Narrative, Ammonia Nitrogen Calculations and Map

PREPARED BY: Zainah Masri – WY/3

APPROVED BY: _____ Date: _____
Diane Figiel, PE,
Water Resources Engineer

E-cc: Michelle BalkLudwig, Regional Wastewater Supervisor – Spooner/NOR
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Environmental Engineering Manager – WY/3
Kari Fleming, Natural Resources Program Manager – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for Village of Luck

WPDES Permit No. WI-0021482-11-0

Prepared by: Zainah Masri – WY/3

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Luck owns and operates an aerated lagoon wastewater treatment facility (WWTF) that discharges treated effluent to either groundwater or surface water. Treated wastewater can be discharged to groundwater via three seepage cells located immediately northwest of the aerated lagoons. Treated wastewater can be discharged to surface water through six (6) discharge points located in the wetland immediately west of the WWTF. The wetland drains to North Star Creek located to the north, which is tributary to the South Fork of the Trade River, located in the Trade River Watershed.
Attachment #3 is a map of the area showing the approximate location of Outfall 002.

Existing Permit Limitations

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

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate	0.364 MGD					1
BOD_5			30 mg/L	20 mg/L		1,2
TSS			30 mg/L	20 mg/L		1,2
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1,2
Ammonia Nitrogen May – October November – April	 Variable Variable		 9.6 mg/L -			3
Copper						4
Chloride						4
Hardness						5
Phosphorus LCA Limit HCA Limit Final				 2.3 mg/L 1.0 mg/L 0.225 mg/L 5.8 lbs/day	 0.075 mg/L	6
TKN, Nitrate+Nitrite, and Total Nitrogen						7
Chronic WET						8

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. The 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 – LAL

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq pH \leq 6.1$	83	$7.0 < pH \leq 7.1$	51	$8.0 < pH \leq 8.1$	11
$6.1 < pH \leq 6.2$	82	$7.1 < pH \leq 7.2$	46	$8.1 < pH \leq 8.2$	8.8
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$6.8 < pH \leq 6.9$	60	$7.8 < pH \leq 7.9$	16	$8.8 < pH \leq 8.9$	2.4
$6.9 < pH \leq 7.0$	56	$7.9 < pH \leq 8.0$	13	$8.9 < pH \leq 9.0$	2.0

4. Monitoring only during quarters where surface water discharge occurs.
5. Monitor only during quarters in which a surface water discharge occurs. Monitoring should coincide with copper sampling.
6. An MDV interim limit for phosphorus of 1.0 mg/L was scheduled to be achieved by September 30, 2021.
7. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).
8. The IWC for chronic WET was 100%. Dilution series: At least five effluent concentrations and dual controls must be included in each test.
    - Chronic: 100, 75, 50, 25, 12.5% and any additional selected by the permittee.

Receiving Water Information

- Name: Unnamed Wetland to North Star Creek (in ch. NR 104 as Drainage – North Star Creek tributary to Trade River)
- Waterbody Identification Code (WBIC): 2641700 (North Star Creek). Not available for the Unnamed Wetland.
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited aquatic life community and effluent ditch from treatment plant to the center of Section 21. Approximately 0.5 miles from the outfall, North Star Creek is a cold water sport fish community, Class 2 trout stream. Both waterbodies are not a public water supply.

- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and

7-Q_2 values are from USGS for Station for both the Unnamed Wetland and North Star Creek at NW ¼, SW ¼, Section 21; T36N – R17W, where Outfall 002 is located.

7-Q_{10}= 0 cubic feet per second (cfs)
7-Q_2 = 0 cfs
Harmonic Mean Flow = 0 cfs

The Harmonic Mean has been estimated based on average flow and the 7-Q_{10} using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).

- Hardness = 210 mg/L as $CaCO_3$; Effluent hardness is used in place of receiving water because there is no receiving water flow upstream of the discharge.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Source of background concentration data: Background concentrations are not included because they do not impact the calculated WQBEL when the receiving water low flows are equal to zero.
- Multiple dischargers: None.
- Impaired water status: The Unnamed Wetland and North Star Creek are not listed under the Clean Water Act (CWA) Section 303(d). The South Branch Trade River, approximately two miles from the outfall is listed as impaired for total phosphorus. Lake St. Croix, approximately 50 miles downstream of the outfall, is listed as impaired for total phosphorus and this discharge is included in the Lake St. Croix TMDL.

Effluent Information

- Design flow rate(s):
  Annual average = 0.171 million gallons per day (MGD)
  For reference, the actual average flow from August 2019 to May 2025 was 0.10 MGD.
  The 0.17 MGD is used to account for the noncontinuous nature of the discharge.
- Hardness = 210 mg/L as $CaCO_3$. This value represents the geometric mean 19 samples collected from August 2019 to in May 2025 which were reported from DMR required monitoring.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with no industrial contributors.
- Water supply: Municipality waterworks and private wells.
- Additives: The Village of Luck has included 1 additive in the permit application that have the potential to be present in Outfall 002. The additive is listed below:
  - Ferric Chloride, Hawkins Chemical – Phosphorus Removal
  - An additive review is not necessary for any additives where either the toxicity is well documented and understood, can be controlled by a WQBEL, or are not believed to be present in the discharge. This is the case upon initial review of the listed additives and the facility is not requesting increased dosages or use frequencies. Therefore, an additive review is not needed at this time.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus ammonia, chloride, hardness and phosphorus.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Attachment #1

Chloride Effluent Data

Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)	Sample Date	Chloride (mg/L)
4/7/2021	156	6/15/2022	2.3	5/22/2024	136
7/7/2021	186	5/17/2023	127	7/31/2024	126
11/3/2021	203	8/16/2023	222	10/16/2024	167
5/11/2022	120	10/11/2023	325	5/25/2025	162
1-day P_{99} = 412 mg/L					
4-day P_{99} = 269 mg/L					

Copper Effluent Data

	Copper (µg/L)
1-day P_{99}	13
4-day P_{99}	10
30-day P_{99}	7.9
Mean	6.9
Std	1.9
Sample size	26
Range	<6 - 13

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

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

Parameters with Effluent Limits

	Average Measurement	Average Mass Discharged
Flow Rate	0.17 MGD	-
BOD_5	6.1 mg/L*	-
TSS	2.4 mg/L*	-
pH field	6.8 s.u.	-
Dissolved Oxygen	7.5 mg/L	-
Ammonia Nitrogen	0.54 mg/L*	-
Phosphorus	0.70 mg/L*	1.0 lbs/day

*Results below the limit of detection (LOD) were included as zeroes in calculation of average.

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

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

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

exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)

3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

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

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

Where:

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

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

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

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

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

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

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 0 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT*	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19	19				
Arsenic		340	340	68	1.4		
Cadmium	210	68	68	14	<1		
Chromium	210	3,311	3,311	662	<2		
Copper	210	31	31			13	13
Lead	210	219	219	44	<1		
Nickel	210	879	879	176	<9		

Attachment #1

SUBSTANCE	REF. HARD. mg/L	ATC	MAX. EFFL. LIMIT*	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Zinc	210	230	230	46	31		
Chloride (mg/L)		757	757			412	325

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 0 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.3	7.3			
Arsenic		152	152	30	1.4	
Cadmium	175	3.8	3.8	0.8	<1	
Chromium	210	243	243	49	<2	
Copper	210	20	20			10
Lead	210	57	57	12	<1	
Nickel	210	138	138	28	<9	
Zinc	210	230	230	46	31	
Chloride (mg/L)		395	395			269

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

Monthly Average Limits based on Wildlife Criteria (WC)

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

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 0 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	880	880	176	<1
Chromium (+3)	8,400,000	8,400,000	1,680,000	<2
Lead	2,240	2,240	448	<1
Nickel	110,000	110,000	22,000	<9

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 0 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	40	40	8	1.4

Conclusions and Recommendations

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

Copper – Considering available effluent data from the current permit term August 2019 to May 2025 the 1-day P_{99} concentration is 13 µg/L, with a maximum concentration of 13 µg/L. The maximum effluent concentration and the 1-day P_{99} of the effluent data do not exceed the calculated daily maximum limit, **therefore concentration and mass limits, are not required but monitoring is recommended, as reasonable potential was demonstrated when comparing of the limit to the mean concentration, but**

Chloride – Considering available effluent data from the current permit term April 2021 to May 2025 the 1-day P_{99} chloride concentration is 412 mg/L, and the 4-day P_{99} of effluent data is 269 mg/L.

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

Mercury – The permit application did not require monitoring for mercury because the Village of Luck Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The concentration in the sludge from September 13, 2022 was 1.6 mg/kg. **Therefore, no mercury monitoring is recommended at Outfall 001.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code.

Source water data is available for this facility, which yielded a maximum PFOS result of 1.6 ng/L and 0.66 ng/L PFOA. There is no effluent data available. The result for PFOS in the source water is not greater than one fifth of the of the 8 ng/L criteria and the results for PFOA is less than one fifth of the 95 ng/L criteria. Based on the type of discharge, the effluent flow rate, and the available PFOS/PFOA monitoring data, **PFOS and PFOA monitoring is not recommended.**

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, and weekly average. 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.
- Section NR 106.07(3), Wis. Adm. Code requires weekly and monthly average limits for

municipal treatment plants.

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

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 269 sample results were reported from August 2019 to July 2025. The maximum reported value was 14 s.u. (Standard pH Units). The effluent pH was 7.6 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.1 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 8.0 s.u. Therefore, a value of 8.0 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.0 s.u. into the equation above yields an ATC = 13 mg/L.

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

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

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	26
1-Q_{10}	13

The 1-Q_{10} method yields the most stringent limits for Village of Luck.

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

Attachment #1

Daily Maximum Ammonia Nitrogen Limits – LAL

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

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC)
The weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous WQBEL memo are shown in attachment #2.

Effluent Data
The following table evaluates the statistics based upon ammonia data reported from August 2019 to July 2025.

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
1-day P_{99}	6.6
4-day P_{99}	4.5
30-day P_{99}	1.9
Mean*	0.57
Std	2.0
Sample size	172
Range	<0.1 - 25

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

Ammonia Nitrogen mg/L	May – October	November - April
1-day P_{99}	6.8	3.2
4-day P_{99}	4.7	1.7
30-day P_{99}	2.0	0.93
Mean*	0.57	0.59
Std	2.2	0.67
Sample size	143	29
Range	<0.1 - 25	<0.1 - 3

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

Reasonable Potential
The permit currently has daily maximum limits year-round and weekly limits from May – October. There is reasonable potential for the acute limits for ammonia nitrogen. Where there are existing ammonia nitrogen limits in the permit, the limits must be retained regardless of reasonable potential, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

> (b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Conclusions and Recommendations
In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L
March – October	Variable or 13 mg/L	9.6 mg/L
November – April	Variable or 13 mg/L	9.6 mg/L

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

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

The Department has considered the information required by s. NR 210.06(3), Wis. Adm. Code, and has determined that the discharge cannot meet bacteria limits without disinfection. Section NR 210.06(2)(a)1,

Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

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

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

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

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

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

Water Quality-Based Effluent Limits (WQBEL)

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

The Lake St. Croix TMDL report was written to ensure that phosphorus water quality criteria are attained in Lake St. Croix and are not necessarily protective of phosphorus water quality criteria 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.

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters [s. NR 102.06 (6) (d)]. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some

time in the future, the Department may adopt phosphorus criteria based on new studies focusing on limited aquatic life waters.

The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020) suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), since ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The discharge location of the wastewater from the Village of Luck is classified as limited aquatic life downstream from the point of discharge approximately 0.5 miles downstream to North Star Creek. North Star Creek is classified for cold water sport fishery uses and downstream impacts are considered for this evaluation.

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 North Star 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):

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

Where:

WQC = 0.075 mg/L for North Star Creek.
Qs = 100% of the 7-Q_2 = 0 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 = 0.171 MGD = 0.265 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

Since the receiving water flow is equal to zero, the effluent limit is set equal to criteria.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from August 2019 to July 2025. The compliance schedule ended on September 30,2021 when the final limit went into affect.

Attachment #1

Total Phosphorus Effluent Data

Phosphorus mg/L	08/2019 – 07/2025	Before 09/30/2021	After 09/30/2021
1-day P_{99}	2.0	1.6	2.4
4-day P_{99}	1.3	1.1	1.4
30-day P_{99}	0.88	0.84	0.91
Mean	0.70	0.71	0.69
Std	0.38	0.29	0.46
Sample size	172	85	87
Range	0.25 - 4.5	0.25 - 2.2	0.27 - 4.5

Phosphorus lbs/day	08/2019 – 07/2025	Before 09/30/2021	After 09/30/2021
1-day P_{99}	3.4	4.0	2.4
4-day P_{99}	2.0	2.4	1.5
30-day P_{99}	1.3	1.6	1.1
Mean	1.0	1.2	0.84
Std	0.65	0.77	0.45
Sample size	172	85	87
Range	0.31 - 4.2	0.34 - 4.2	0.31 - 3.7

TMDL Limits

Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs (*April 2020) and are based on the annual phosphorus wasteload allocation (WLA) given in pounds per year. This WLA found of the *Total Maximum Daily Load Lake St. Croix Nutrient Total Maximum Daily Load (TMDL)* report dated August 08, 2012 are expressed as maximum annual loads (lbs/year).
The TP WLA for Village of Luck is 1,108 lbs/year. The following table summarizes Village of Luck's annual loading from the current permit term:

Annual TP Loading

Year	TP lbs/year
2021	336
2022	175
2023	110
2024	182

Village of Luck is currently meeting the annual WLA of 1,108 lbs/year, and 3 lbs/day based on currently available data. It is recommended that the **current TMDL-based limit of 5.8 lbs/day as a monthly average to continue in the reissued permit.**

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.

Multi-Discharge Variance Interim Limit
With the permit application, Village of Luck has re-applied for the phosphorus multi-discharger variance (MDV). Conditions of the phosphorus MDV require the facility to comply with an interim phosphorus limit in lieu of meeting the final WQBEL. The recommended interim limit during the 2nd permit under MDV approval, pursuant to s. 283.16 (6) (a), Wis. Stats., is 0.6 mg/L as a monthly average. Based on the available data, it appears a compliance schedule may be appropriate to meet this interim limit but compliance with 0.6 mg/L shall be no later than the end of the reissued permit. The previous interim limit of 1.0 mg/L should not be exceeded during the compliance schedule.

PART 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 Chapters NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as Limited Aquatic Life according to s. NR 104.02(3)(b)1, Wis. Adm. Code, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 and described in s. NR 106.55(2), Wis. Adm. Code, which has a daily maximum effluent temperature limitation of 120 ºF.

Lagoon-based systems utilize long hydraulic detention times (6 – 12 months) and discharge small volumes of effluent; therefore, elevated effluent temperatures are unlikely and discharge temperatures are expected to be similar to ambient conditions. Due to the WWTF treating solely domestic wastewater, there is no reasonable potential for the discharge to exceed the effluent limit. Therefore, **thermal limits are not recommended in the reissued permit.**

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).

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

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The **IWC of 100%,** shown in the WET Checklist summary below, was calculated according to the

following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$IWC\ (as\ \%) = Q_e \div \{(1 - f)\ Q_e + Q_s\} \times 100$$

Where:

Q_e = annual average flow = 0.171 MGD = 0.265 cfs

f = fraction of the Q_e withdrawn from the receiving water = 0

Q_s = ¼ of the 7-Q_{10} = 0 cfs ÷ 4 = 0 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 002 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 002. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Pass or Fail?	Use in RP?	
12/14/2004	-	-	-	-	>100	90	Fail	No	1
05/03/2005	-	-	-	-	>100	>100	Pass	No	1
09/21/2005	-	-	-	-	63	20	Fail	No	1
10/25/2005	-	-	-	-	>100	>100	Pass	No	1
11/15/2005	-	-	-	-	>100	>100	Pass	No	1
11/27/2012	-	-	-	-	>100	>100	Pass	No	2
03/25/2014	-	-	-	-	84	81	Fail	No	2
05/13/2014	-	-	-	-	>100	>100	Pass	No	2
05/01/2018	-	-	-	-	>100	>100	Pass	Yes	-
06/21/2022	-	-	-	-	>100	>100	Pass	Yes	-
08/12/2024	-	-	-	-	>100	>100	Pass	Yes	-

Footnotes:

1. *Data Not Representative.* A Toxicity Identification Evaluation (TIE) report was completed in November 2010 in response toxicity detects occurring in the December 2004 and September 2005 chronic WET tests. Preliminary discussion in November 2009 identified ammonia nitrogen and copper as probable causes for toxicity. The report has concluded that the ammonia was the predominant constituent for the toxicity related to

the C. dubia while copper was not shown to be contributing to the overall toxicity. Effluent copper data collected over the current permit term does not show reasonable potential to exceed any calculated limits. In addition, effluent ammonia nitrogen data also does not show reasonable potential to exceed calculated limits when evaluated after the facility upgrade completion. Therefore, WET tests prior to 2006 are not considered to be representative of the current discharge.

2. *Data Not Representative.* Significant WWTF upgrades that occurred over the current permit term include a bar screen, lagoon covers, curtain baffles, aeration, MBBR, and ferric chloride chemical addition. Construction started in June 2016 and was completed May 2017. Therefore, any WET tests performed before June 2017 are no longer are representative of the current discharge.

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

  Chronic Reasonable Potential = [(TUc effluent) (B)(IWC)]

  According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

  Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.
  Chronic Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. **0 Points**	IWC = 100 %. **15 Points**
Historical Data	No tests used to calculate RP. No tests failed. **5 Points**	2 tests used to calculate RP. No tests failed. **0 Points**

Attachment #1

	Acute	Chronic
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	< 4 mi to non-variance **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Reasonable Potential for limits based ATC. Ammonia nitrogen limit carried over from the current permit. Arsenic, copper, zinc and chloride detected. **8 Points**	No reasonable potential for limits based on CTC; Ammonia nitrogen limit carried over from the current permit. Arsenic, copper, zinc and chloride detected. **3 Points**
Additives	0 Biocides and 1 Water Quality Conditioner added. Permittee does not have proper P chemical SOPs in place **16 Points**	All additives used more than once per 4 days. **16 Points**
Discharge Category	0 Industrial Contributors. **0 Points**	Same as Acute. **0 Points**
Wastewater Treatment	Secondary or Better **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**34 Points**	**39 Points**
Recommended Monitoring Frequency (from Checklist):	3 tests during permit term	1x yearly during permit term
Limit Required?	No	No
TRE Recommended? (from Checklist)	No	No

- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described above, **3 acute WET tests throughout the permit term and 1 chronic WET test per year are recommended in the reissued permit.** Sampling WET concurrently with any chemical-specific toxic substances is recommended. Chronic WET testing should continue after the permit expiration date (until the permit is reissued).

- **If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute and chronic WET testing can be reduced to 2 tests throughout the reissued permit term.**

Ammonia Nitrogen Calculations from WQBEL June 17, 2020

Weekly and Monthly Average Limits based on Chronic Toxicity Criteria (CTC):
Ammonia limits were last calculated in the previous WQBEL memorandum dated May 2014. Maximum temperatures have decreased in summer from 25 to 21 °C and increased in winter from 3 to 10 °C. These values are based on ambient stream temperatures found in Table 2 of ch. NR 102 thermal standards. The background pH values in summer and winter have both increased from 7.48 and 7.52 to 8.08 and 7.99 respectively. These values are based on the receiving water hardness set equal to the effluent hardness. The remainder of the background information affecting chronic ammonia criteria and limits are not needed when the receiving water low-flow is zero using the procedure in s. NR 106.32, Wis. Adm. Code.

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code. The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as Limited Aquatic Life is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

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

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 °C, 25% of the flow is used if the Temperature < 11 °C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

Unnamed Wetland (LAL)		Summer	Winter
		May – Oct.	Nov. – April
Effluent Flow	Qe (MGD)	0.171	0.171
Background Information	7-Q_{10} (cfs)	0	0
	7-Q_2 (cfs)	0	0
	Ammonia (mg/L)	NA*	NA*
	Average Temperature (°C)	NA*	NA*
	Maximum Temperature (°C)	21	10
	pH (s.u.)	8.08	7.99
	% of Flow used	NA*	NA*
	Reference Weekly Flow (cfs)	0	0
	Reference Monthly Flow (cfs)	0	0
Criteria mg/L	4-day Chronic	23.9	54.0
	30-day Chronic	9.6	21.6
Effluent Limits mg/L	Weekly Average	24	54
	Monthly Average	9.6	22

*NA denotes "Not Applicable" when the receiving water low-flow is zero.

Ammonia Decay:
The Department must establish limits to protect downstream uses, according to s. NR 106.32 (1) (b), Wis. Adm. Code. Ammonia decay may be considered when determining limits at the outfall to protect the downstream classification, according to s. NR 106.32 (4) (c), Wis. Adm. Code. Where the calculated limits are more restrictive based on downstream uses, ammonia decay can be considered to determine if these more restrictive limits are needed or if the ammonia will decay before it reaches the point of the classification change. North Star Creek located approximately 0.5 miles downstream of Outfall 002 is classified as a cold water community. The assumed basin background information is provided in the table below, with the resulting criteria and effluent limitations.

below, with the resulting criteria and effluent limitations.

North Star Creek (CW Cat. 5)		Summer May – Oct.	Winter Nov. – April
Effluent Flow	Qe (MGD)	0.171	0.171
Background Information	7-Q_{10} (cfs)	0	0
	7-Q_2 (cfs)	0	0
	Ammonia (mg/L)	NA*	NA*
	Average Temperature (°C)	NA*	NA*
	Maximum Temperature (°C)	18	8
	pH (s.u.)	7.35	7.19
	% of Flow used	NA*	NA*
	Reference Weekly Flow (cfs)	0	0

North Star Creek (CW Cat. 5)		Summer May – Oct.	Winter Nov. – April
	Reference Monthly Flow (cfs)	0	0
Criteria mg/L	4-day Chronic	9.9	13.5
	30-day Chronic	4.0	5.4
Effluent Limits mg/L	Weekly Average	9.9	14
	Monthly Average	4.0	5.4

*NA denotes "Not Applicable" when the receiving water low-flow is zero.

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

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

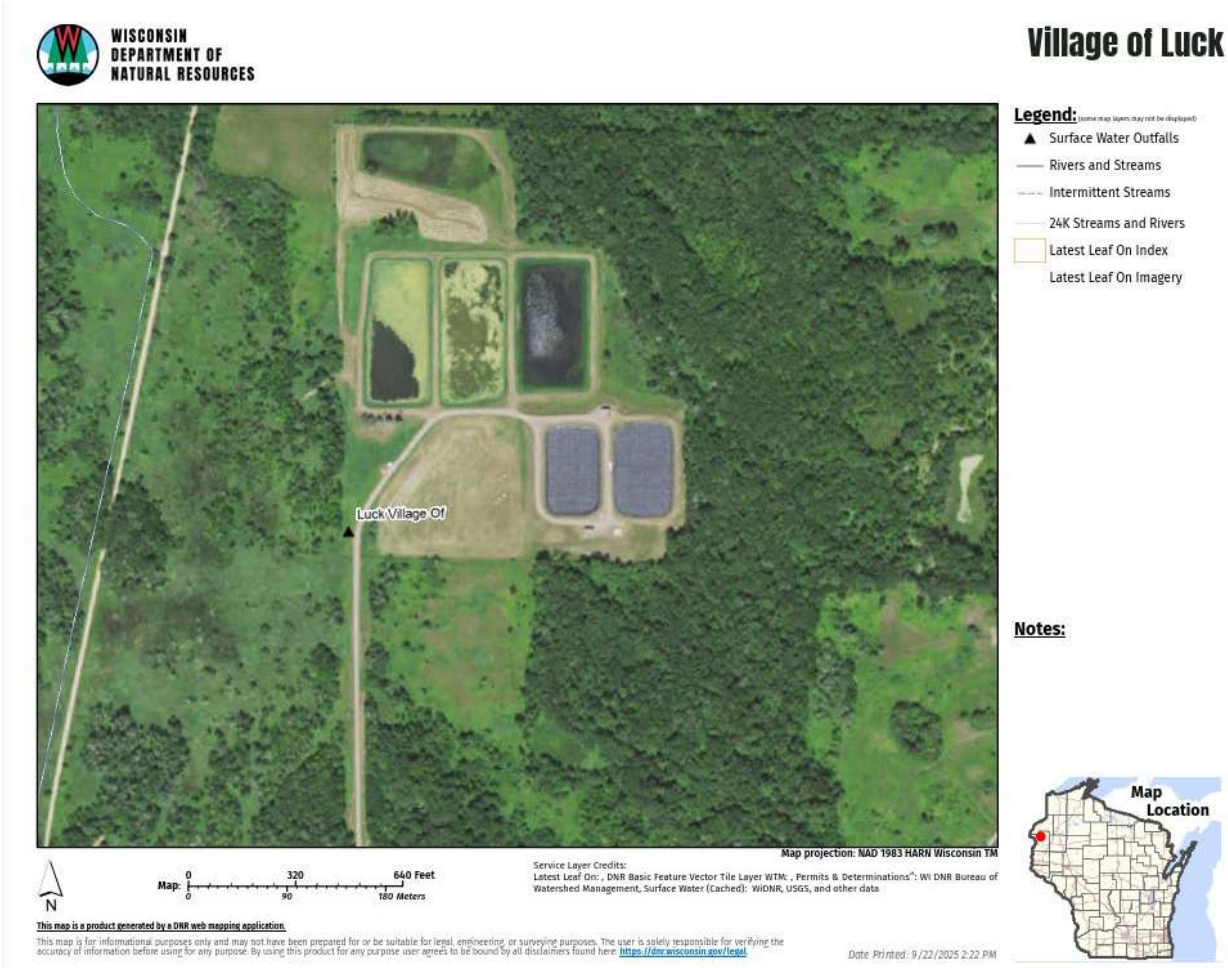
Where: N_{Limit} = Ammonia limit needed to protect downstream use (mg/L)
N_{down} = Ammonia limit calculated based on downstream classification and flow (mg/L)
$-k_t$ = Ammonia decay rate at background stream temperature (day^{-1})
T = Travel time from outfall to downstream use (day)

The velocity of receiving water is assumed to be 0.07 miles per day and the distance from the point of discharge to the classification change is approximately 0.5 miles for a travel time of 7.1 days. This equation shows that at the location where the classification change, 24 – 55% of the ammonia is remaining during May – October and November – April respectively. After decay, the limits are increased as shown in the following table.

	LAL		CW Cat. 5		CW Cat. 5 After decay		Most Restrictive Limits	
Months Applicable	Weekly Average mg/L	Monthly Average mg/L	Weekly Average mg/L	Monthly Average mg/L	Weekly Average mg/L	Monthly Average mg/L	Weekly Average mg/L	Monthly Average mg/L
May – Oct.	24	9.6	9.9	4.0	42	17	24	9.6
Nov. – April	54	22	14	5.4	25	9.9	25	9.9

Section NR 106.33(2), Wis. Adm. Code, was updated effective September 1, 2016. As a result, seasonal 20 and 40 mg/L thresholds for including ammonia limits in municipal discharge permits are no longer applicable under current rules. Section NR 106.33(1) , Wis. Adm. Code, enables the Department to determine the need to include ammonia limits in municipal discharge permits based on the statistical comparisons in s. NR 106.05, Wis. Adm. Code.

Site Map:


WISCONSIN
DEPARTMENT OF
NATURAL RESOURCES
Village of Luck
Legend:
Surface Water Outfalls
Rivers and Streams
Intermittent Streams
24K Streams and Rivers
Latest Leaf On Index
Latest Leaf On Imagery
Luck Village Of
Notes:
Map projection: NAD 1983 HARN Wisconsin TM
N
Map:
0
320
640 Feet
0
90
180 Meters
Service Layer Credits:
Latest Leaf On: , DNR Basic Feature Vector Tile Layer WTM: , Permits & Determinations*: WI DNR Bureau of Watershed Management, Surface Water (Cached): WiDNR, USGS, and other data
Map Location
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Date Printed: 9/22/2025 2:22 PM

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 31, 2025

TO: File

FROM: Woody Myers - WCR

SUBJECT: Groundwater Evaluation for Village of Luck, WI-0021482

Site Information

The Village of Luck facility is located at 260th Avenue, Luck, Wisconsin, Polk County. This is a municipal wastewater treatment facility. Wastewater is currently treated and discharged to a surface water and Groundwater via wetland and absorption pond discharge respectively. The absorption ponds are located in the NE ¼ of the SW ¼ of Section 21, T36N, R17W, Town of Luck.

Land Disposal Effluent & Groundwater Evaluation Summary

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

Parameter	Current Permit WI-0021482-10		Proposed Permit WI-0021482-11	
	Limits and Units	Limit Type	Limits and Units	Limit Type
Flow Rate	- MGD		- MGD	
$CBOD_5$	45 mg/l	Monthly Avg	45 mg/l	Monthly Avg
Total Suspended Solids	- mg/l		- mg/l	
Total Dissolved Solids	- mg/l		- mg/l	
pH, Field	- su		- su	
Nitrogen. Ammonia	- mg/l		- mg/l	
Nitrogen, Total Kjeldahl	- mg/l		- mg/l	
Nitrogen, Nitrite + Nitrate	- mg/l		- mg/l	
Nitrogen, Total	- mg/l		- mg/l	
Nitrogen, Organic	- mg/l		- mg/l	
Chloride	- mg/l		- mg/l	

* Proposed permit changes

Table 2 Monitoring Wells

Well	Current Permit WI-0021482-10		Proposed Permit WI-0021482-11	
	Well Location	Well Designation	Well Location	Well Designation
803 (MW803)	Side-gradient	Non-Point of Standard	Side-gradient	Non-Point of Standard
805 (MW805)	Up-gradient	Background	Up-gradient	Background
807 (MW807)	Down-gradient	Point of Standard	Down-gradient	Point of Standard
808 (MW808)	Down-gradient	Point of Standard	***Abandoned 9/30/2020**	
810 (MW810)	Down-gradient	Point of Standard	Down-gradient	Point of Standard
811 (MW811)	Down-gradient	Point of Standard	Down-gradient	Point of Standard

* Proposed permit changes

Table 3 Groundwater Quality Standards

Parameter	Current Permit WI-0021482-10		Proposed WI-0021482-11	
	PAL	ES	PAL	ES
Depth to Groundwater	N/A	N/A	N/A	N/A
Groundwater Elevation	N/A	N/A	N/A	N/A
Nitrogen, Nitrite + Nitrate	2.0 mg/l	10.0 mg/l	2.0 mg/l	10.0 mg/l
Chloride	125 mg/l	250 mg/l	125 mg/l	250 mg/l
pH, Field	5.6-7.6 su	N/A	***5.8-7.8 su**	N/A
Nitrogen Total Kjeldahl	N/A	N/A	N/A	N/A
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	0.97 mg/l	9.7 mg/l
Nitrogen, Organic	2.3 mg/l	N/A	***2.6 mg/l**	N/A
Total Dissolved Solids	320 mg/l	N/A	***325 mg/l**	N/A

* Proposed permit changes

Geology

The bedrock under this facility is the Chengwatana Volcanic group. This group consists of a light to dark basalt flow with interflow of breccia and tuff. This group is a middle Proterozoic formation (*Bedrock Geology of Wisconsin, Regional Map Series Northwest Sheet*, Wisconsin Geological and Natural History Survey (WGNHS), 1987). Depth to bedrock is anticipated to be between 100 and 200 feet below ground surface (bgs)(*Depth to Bedrock in Wisconsin,* WGNHS, 1973). The regolith consists of material ranging silty sand to sand. Surface soil primarily consists of the Amery sandy loam and the Santiago silt loam (USDA NRCS Web Soil Survey).

Hydrogeology

Calculated groundwater elevations range between 1185 and 1229 feet above mean sea level (msl). Depth to groundwater was reported to be between 5 and 13 feet bgs. Groundwater flow direction was calculated to be predominately to the west. Regional groundwater is to the west in this area of Polk County but can be highly variable (*Generalized Water-Table Elevation Map of Polk County*, Map, WGNHS, 2000). The site is adjacent to the North Star creek that eventually discharges to the Trade River. There are eight wells (municipal, other than municipal, private and high-capacity) within a 1,500-foot range of this facility's groundwater discharge.

Land Disposal Effluent Quality and Loading Rates

The following table is the average flow (hydraulic loading), total nitrogen, chloride and $CBOD_5$ loading summations for the Land Disposal System.

Table 5 Land Treatment Disposal Loading Averages

Year	Flow (MGD)	Nitrogen (mg/l)	Chloride (mg/l)	CBOD5 (mg/l)
2025#	0.132	24.40	184	2.9
2024	0.125	29.75	188	2.3
2023	0.170	31.86	192	3.6
2022	0.120	34.40	195	4.3
2021	0.123	31.37	193	3.0
2020	0.129	27.33	155	2.6

# Indicates partial year

Groundwater Monitoring System and Sampling Frequency

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

Table 6 Groundwater Monitoring Well Data

Sample Point	Well Name	Elevation (feet above msl)				Length (feet)		Well Type
		Casing Top	Ground Surface	Screen Top	Screen Bottom	Screen Length	Well Depth	
803	MW803					10	14.0	WT
805	MW805					10	17.0	WT
807	MW807					10	15.7	WT
810	MW810					10	15.0	WT
811	MW811					10	14.0	WT

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

Groundwater sampling results from this facility have been analyzed for each well to evaluate trends of the regulated compounds in groundwater and to calculate PALs for s. NR 140.22 Wis. Adm. Code Indicator Parameters and to evaluate potential exemptions under s. NR 140.28 Wis. Adm. Code. The groundwater was evaluated by looking at the groundwater data from March 17, 2020 – May 13, 2025.

Background Groundwater Quality

There were no PAL exceedances observed in the background groundwater quality (well 805) and the trends for the results were stable with the exception of a chloride sample result on October 24, 2023 of 202 mg/l. Given the results preceding and proceeding this result it is assumed this is a typo and will not be included in calculation of potential exemptions.

Down-Gradient Groundwater Quality

There are exceedances in several groundwater monitoring wells for three compounds, nitrite + nitrate, ammonia and chloride. Nitrite + nitrate exceeded the ES frequently in well 803 and consistently exceeded the PAL in wells 808 and 810 (see Figure 1). The exceedances do not have a clear trend (increasing or decreasing).

Ammonia exceeded the PAL consistently in groundwater monitoring well 811 (see Figure 2), but did not achieve the ES. The trend is stable.

Chloride exceedances of the PAL were observed in wells 803, 807 and 810. There were no ES exceedances. The trends in wells 803 and 807 are increasing over time (see Figure 3).

All of these groundwater sampling results are above the background groundwater samples collected from well 805.

Land Disposal System Impact to Groundwater Quality

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

Proposed Groundwater Monitoring Requirements

Table 7 Groundwater Quality Sampling Frequency and Limits WI-0021482-11
Outfall 001 Absorption Ponds

Sample Point	Well Name	Sample Frequency	Well Designation
803	MW803	Quarterly	Non-Point of Standard
805	MW805	Quarterly	Background
807	MW807	Quarterly	Point of Standard
810	MW810	Quarterly	Point of Standard
811	MW811	Quarterly	Point of Standard
Parameter	PAL	ES	Source
Depth to Groundwater	N/A	N/A	Measured
Groundwater Elevation	N/A	N/A	Measured
Nitrogen, Nitrite + Nitrate	2.0 mg/l	10.0 mg/l	NR 140 Table 1
Chloride	125 mg/l	250 mg/l	NR 140 Table 2
pH, Field	***5.8-7.8 su**	N/A	Calculated
Nitrogen, Kjeldahl	N/A	N/A	Measured
Nitrogen, Ammonia	0.97 mg/l	9.7 mg/l	NR 140 Table 1
Nitrogen, Organic	***2.6 mg/l**	N/A	Calculated
Total Dissolved Solids	***325 mg/l**	N/A	Calculated

* Proposed permit changes

Indicator Parameter PALs

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

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

And for pH:

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

Alternative Concentration Limits

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

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

Conclusions

There are no recommended changes for the Outfall Sampling Point (effluent) at this time, however, they maybe considered as a ss. NR 140.24 or NR 140.26 Wis. Adm. Code response action in the future.

There are multiple groundwater quality standard exceedances in several down-gradient ground water monitoring well sample results of nitrite + nitrate and chloride in wells designated as point of standards application wells. A s. NR 140.26 Wis. Adm. Code response action is required. The first step will be to evaluate the absorption pond load/rest cycles.

Several aerial photos were evaluated and in everyone the absorption ponds appear to be all in a loaded state (full of water) at the same time. Given that the photo timing is unknown, the department cannot ascertain if the cells are all loaded and rested at the same time. Load/rest cycles are an important requirement to optimize the treatment of nitrogen and to avoid groundwater quality standard exceedances.

There were frequent groundwater sample result exceedances of chloride. The only way to reduce chloride concentrations in the effluent is to take action to reduce concentrations in the influent. The facility will be required to investigate and implement ways to reduce chloride in the influent. Frequently chloride in domestic wastewater is from dissolved salt from residential water softening units. A chloride reduction plan will be requires as a s. NR 140.24 Wis. Adm. Code response action.

The PAL exceedances observed in the groundwater quality standards sample results in well 811, were observed in only well 811. This well is the furthest down gradient well and it is located on the down-gradient side of the wetland where the surface water Outfall is located. It appears the exceedances could be from the surface water Outfall and not the land disposal system directly. Additional departmental evaluation is needed. No s. NR 140.24 Wis. Adm. Code response actions are required at this time.

Compliance Schedule Recommendations

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

The facility needs to develop a chloride reduction plan to be submitted to the department within one year of the permit reissuance for approval and implementation within six months of approval.

The facility is required to submit the last five years of load/rest logs to the department within 30 days of permit reissuance for evaluation as a part of the optimization of these cycles.

Figure 1
Nitriate + Nitrate

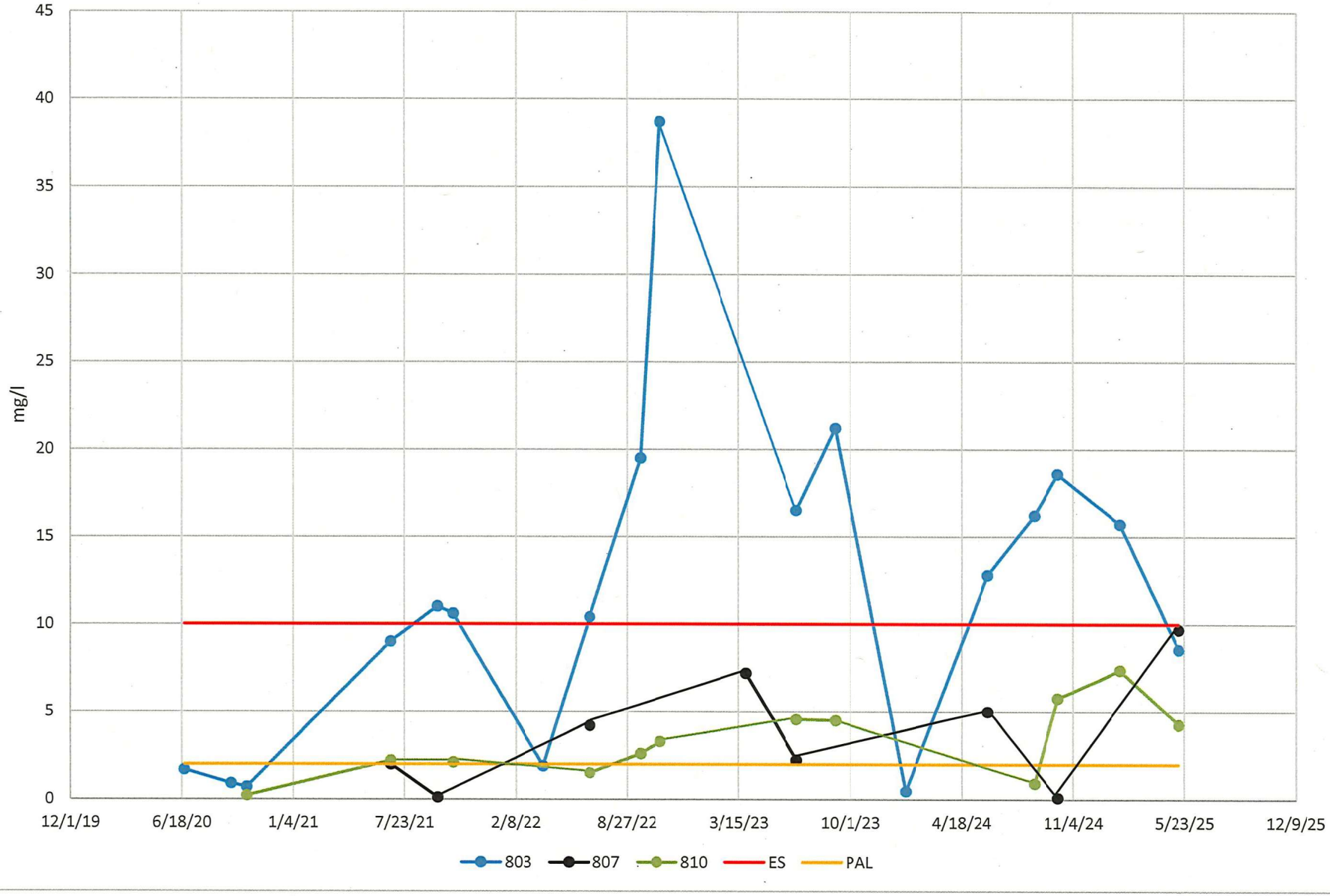


Figure 2
Ammonia

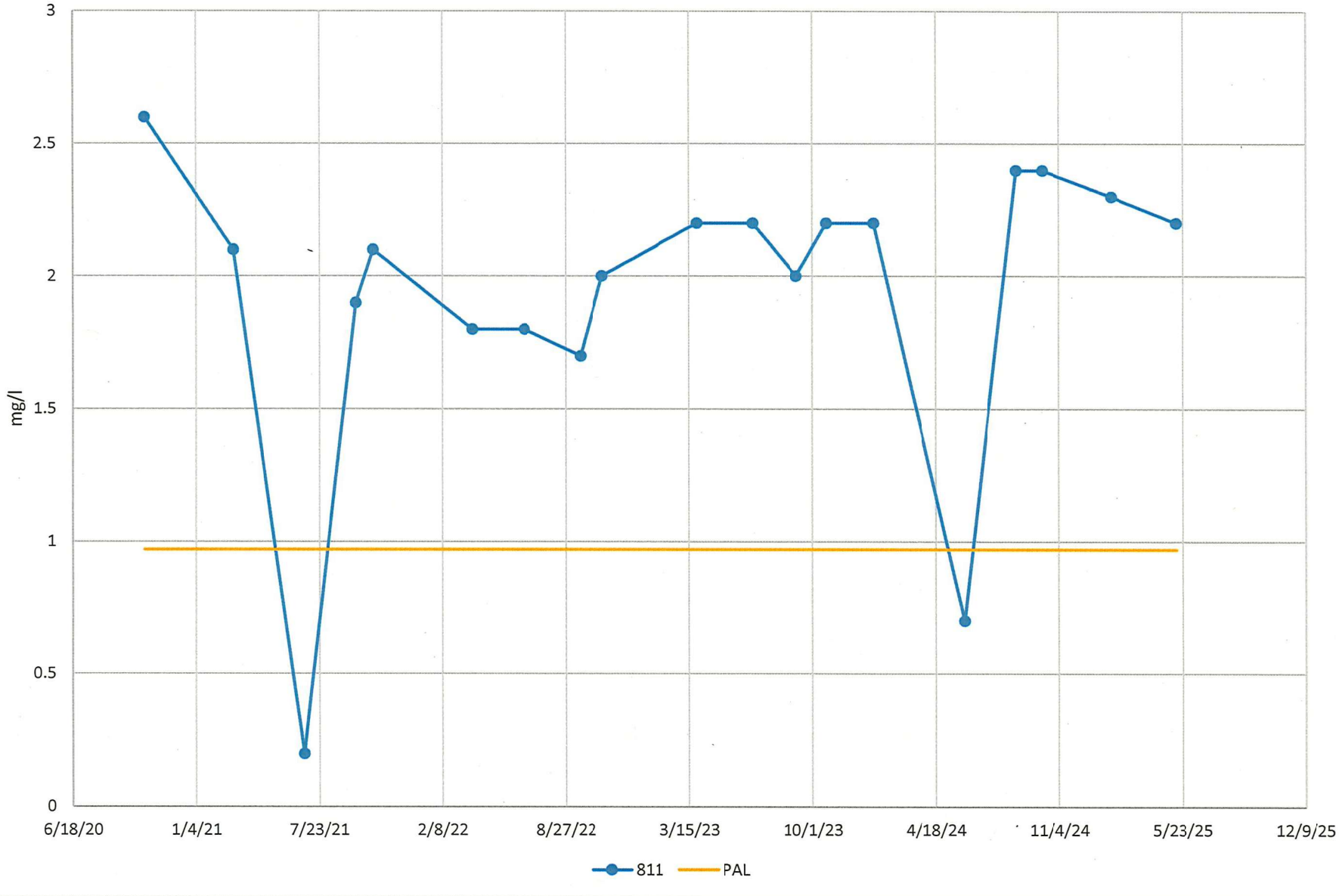
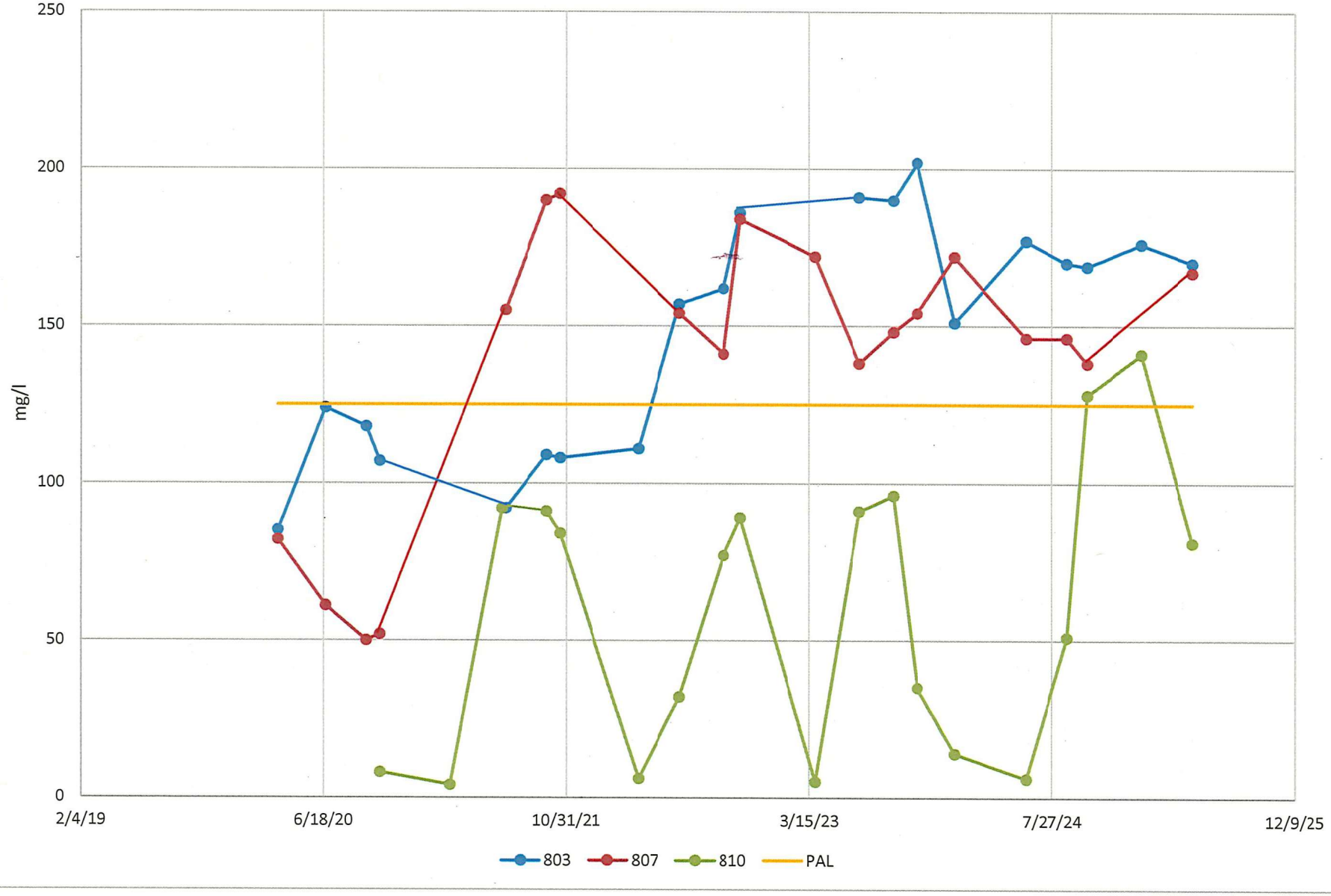


Figure 3
Chloride



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

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

Form 3200-150 (R 03/17)

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

Facility and Permit Information

WPDES Permit No. **WI-** 0 | 0 | 2 | 1 | 4 | 8 | 2			
Facility Name Village of Luck Wastewater Treatment Facility			
Facility Street Address 260th Avenue			
City Luck	State WI	ZIP Code 54853	
Receiving Water UNT North Star Creek	County Polk		
Source of Water Supply Village of Luck	Average Discharge Flow Rate 0.171 MGD		

Facility Contact Information

Contact Name Scott Anderson			
Title Director of Public Works			
Address PO Box 315			
City Luck	State WI	ZIP Code 54853	
Phone No. (incl. area code) (715) 472-2221	Fax Number (715) 472-2214		
Email Address volpublicworks@luckwisconsin.com			

Variance Request Schedule

Check all that apply:

1. This variance is being requested at the time of application for permit reissuance pursuant to s. 283.16(4)(b)1, Wis. Stat. ☒
2. This variance is being requested within 60 days after the department reissues or modifies the permit to include a phosphorus WQBEL pursuant to s. 283.16(4)(b)2, Wis. Stat. ☐
3. This variance is being requested from a current WPDES Permit pursuant to 283.16(4)(b)3, Wis. Stat. ☐

   Date of Current Permit Issuance: _____

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

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

   Yes ◉
   How many permits has the MDV been approved for? 1
   No ○

Variance Requirements

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

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

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

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

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

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

Justify:

To achieve compliance with the 0.075 mg/L effluent phosphorus WQBEL, a tertiary filtration upgrade is needed. Such an upgrade would have significant capital costs and greatly increase the operational requirements of the WWTF.

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

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

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

Check all months for which variance is requested:

◉ All months

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

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

11. Current effluent quality

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

Outfall Number(s)	Conc. (mg/L)	Number of Samples Results Used	Sample Time Period Used	
1	0.68	27	05/01/2024	10/30/2024

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

Facility Information (provide attachments as necessary)

13. What are the average phosphorus levels within your influent TP concentration? 3.63 mg/L

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

◉ Yes

Completion date: 09/30/2021

○ No, but in process of completing

○ No, not yet started

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

- (●) Yes
  Approval date: 05/21/2019
- ( ) No, but in process of completing
- ( ) No, not yet started

16. Briefly describe the technology that would need to be added to comply with phosphorus limits in your permit:
Construction of a tertiary treatment process, such as filtration, would be required for phosphorus permit compliance.

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

Projected Compliance Costs

17. What is the projected net present value cost for complying with the phosphorus WQBELs? $ 4,912,000

Source of cost projection:
2023 capital cost of Disc Filtration technology for a lagoon treatment system with similar flows to the Village of Luck. The cost estimate line items were updated as needed to accurately capture construction requirements in Luck.

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

18. Has the feasibility of water quality trading or adaptive management been evaluated for the facility?
- (●) Yes
- ( ) No

19. Is the facility eligible for adaptive management or water quality trading?
- (●) Yes
- ( ) No

20. What is the needed offset to comply with AM/WQT? 231 lbs/year
- [ ] Unknown at this time

21. Is adaptive management or water quality trading a viable compliance option?
- ( ) Yes
- (●) No

Describe:
Due to the significant quantity of phosphorus removal required to comply with WQT regulations and the limited available partners within the target area, it is unlikely that WQT would be an effective and viable compliance option at this time. The Village has been in contact with the Wisconsin WQT Clearinghouse as part of this MDV application. The Clearinghouse has indicated that there are no active projects in the watershed. If the Village is

interested, the Clearinghouse can evaluate creation of credit-generating projects in the watershed in the coming years. The Village plans to continue working with the Clearinghouse for WQT evaluation during the upcoming WPDES permit term. If a sufficient number of credits can be purchased at an economical cost, the Village may be interested in using WQT for phosphorus compliance in future permit terms as an alternative to the MDV, however, the lack of existing projects makes WQT infeasible for the upcoming permit term.

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

Municipality Name	County	Population Served	Customer Households Served	Median Household Income (MHI)
Village of Luck	Polk	1,093	557	$64,250.00

Non-Residential Customers:

Percent of wastewater flow attributed to commercial industrial, large institutional and any other special customer category: 10 %

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

There are no known non-domestic users that contribute significant phosphorus loadings.

Affordability to Municipal Dischargers

22. What is the projected household user charge, expressed as a percent of MHI, once phosphorus compliance costs are factored in? 1.53 %

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

23. What is the secondary indicator score for the county (counties) in which the service area is located in? 6

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

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

Option A. County payment contribution ◉

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

Submit Form 3200-148 with MDV application

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

Submit Form 3200-148 with MDV application.

Certification

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

Print or type name of person submitting request (Individual must be an Authorized Representative) Jennifer Anderson	Title Village Clerk
Signature of Official Jennifer Anderson	Date Signed 2/4/2025

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

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

6/19/2025

Jennifer Anderson
PO Box 560
Luck, WI 54853

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Trade River in Polk County
Permittee: Village of Luck, WPDES WI-0021482

Dear Ms. Anderson:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for Village of Luck Wastewater Treatment Facility in an application dated 2/12/2025. Wisconsin's multi-discharger phosphorus variance was approved by EPA on February 6, 2017. Coverage under the multi-discharger phosphorus variance may only be granted to an existing source that demonstrates a major facility upgrade is necessary to achieve phosphorus compliance and the upgrade will result in economic hardship as defined in the federally approved variance. The water quality criterion for which you are seeking a variance is contained in s. NR 102.06, Wis. Adm. Code.

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

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

Sincerely,

Matt Claucherty, MDV Point Source Coordinator
Bureau of Water Quality

e-cc Scott Anderson, Village of Luck
Carson Johnson, WDNR
Sheri Snowbank, WDNR
Michelle Woods, EPA Region 5
Tim Elkins, EPA Region 5

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

Multi-Discharger Variance Application Evaluation Checklist

Form 3200-145 (R 5/16)

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

Permittee Name

Village of Luck

WPDES Permit Number	County
WI- 0 | 0 | 2 | 1 | 4 | 8 | 2	Polk

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

7. What is the current effluent level achievable?

Outfall Number(s)	Conc. (mg/L)	Method for calculation:	Does this concur with application?	
002	0.75	(•) 30-day P99 ( ) Other, specify:	( ) Yes (•) No, why not: Application used 2024 data only	*DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.*

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

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

Provide Rationale:

The past three years of phosphorus effluent data yield a 30-day P99 value of 0.75 mg/L. This value is achievable during most months of discharge, but the discharge has exceeded this level during the late summer months due to treatment issues within the lagoon system. These issues are detailed in a certification statement from the permittee to justify a higher interim limit pursuant to s. 283.16(6)(am), Wis. Stats.

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

Save

9. *For Industries Only*- Where does the phosphorus in the effluent come from? (check all that apply)	☐ Process ☐ Additive Usage ☐ Water supply *Can intake credits be given or can the facility use an alternative water supply?* ◯ Not feasible ◯ Possibly, but further analysis needed ◯ Not evaluated at this time	*See Q14-15 & 19 on industrial form. If the answer is "possibly" or "not evaluated", the schedule section of the MDV permit should contain a requirement to perform this analysis.*
10. Has this facility optimized?	◉ Yes ◯ In progress ◯ No	*See Q14 on municipal form & Q16 & 20 on industrial form. Facility must optimize and operate at an optimize treatment level (s. 283.16(6)(a), Wis. Stat.)If no will need compliance schedule.*
11. Has a facility plan/compliance alternative plan been completed for the facility?	◉ Yes ◯ In progress ◯ No	*See Q15 on municipal form & Q17 on industrial form.*
12. What is the projected cost for complying with phosphorus? Source:	$ 2,726,000.00 March 2019 Final Compliance Alternatives Plan. See notes below regarding updated cost estimates	*Facility must submit site-specific compliance costs. If cost projections are used from EIA, the permittee must certify that these costs are reasonable for the facility in question. See "projected compliance costs" in Section 2.02 of the MDV Implementation Guidance for details.*

Comments on planning efforts:

A Final Compliance Alternatives Plan was prepared by MSA Professional Services, Inc for the Village of Luck in March of 2019. The Plan detailed options for complying with the 0.075 mg/L final WQBEL. Alternatives to discharge including regionalization were evaluated (nearest community 7 miles away and unable to accept additional flow) and no feasible options exist. Increasing flow volume to seepage cells is not an option due to nitrogen limitations (current cells covered under variance, additional cells would require full compliance with 10 mg/L nitrogen). Alternative compliance options such as water quality trading and adaptive management were evaluated. The receiving water is point-source dominated, precluding adaptive management. Several major facility upgrade cost estimates are presented, including Ballasted Clarification, Disc Filtration, Ultra Filtration, and Membrane Bioreactor Technology. These cost estimates have been inflation-adjusted for use in 2025. During the current permit term, the Village of Luck has optimized chemical feed. The Village has also further investigated water quality trading via the WQT Clearinghouse. No trading partners are available currently, though this option will need to be further investigated during the next permit term.

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

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Comments on economic demonstration:

The MDV application was supplemented with economic calculations and updated compliance costs. While DNR agrees with the general methodology used, the compliance costs are not being accepted at this time. As a conservative measure, previously-accepted compliance costs were inflation-adjusted from January 2019 to March 2025. The process yielded capital costs of $3,463,371.13 and O&M costs of $10,418.06 annually. Assuming a 20-year CWFP loan at 2.2% interest, annual payments would be $215,918.40. Total costs amount to $226,336.46 when including O&M. The residential use portion is 90%, which results in $203,702.81 as the annual cost borne by households. This cost, divided amongst 557 households results in a per-user rate increase of $365.71 annually. Current rates average $328.08 annually, and the projected annual cost would be $693.79. This cost is 1.08% of the Village's $64,250 MHI. In Polk County with a secondary indicator score of 6, projected sewer user rates at 1% of MHI meets the primary screener. The applicant meets the primary screener.

15. What watershed option was selected?

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

Section 4. Watershed Plan Review

16. MDV Plan Number: *Note: This is for tracking purposes. Contact Statewide Phosphorus Implementation Coordinator for the plan number.*	_____
17. Did the point source complete Form 3200-148?	( ) Yes ( ) No
18. Is the project area in the same HUC 8 watershed as the point of discharge?	( ) Yes ( ) No. *STOP- Watershed plan must be updated.*
19. What is the annual offset required? *See Section 2.03 of the MDV implementation guidance. If this value is different from the offset target provided in form 3200-148, the watershed plan should be amended.*	_____
20. Does the plan ensure that the annual load is offset annually?	( ) Yes ( ) No. *STOP- Watershed plan must be updated.*

21. Are projects occurring on land owned/operated by a CAFO or within a permitted MS4 boundary?

- ( ) Yes. *Work with appropriate DNR staff to ensure projects are not working towards other permit compliance.*
- ( ) No.

22. Are other funding sources being used as part of the MDV watershed project?

- ( ) Yes. *Work with appropriate DNR staff to ensure that funding sources can be appropriately used in the plan area.*
- ( ) No.

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

Save

Comments:

Section 5. Payment to the County(ies)

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

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

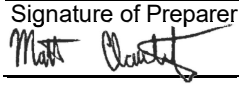
Section 6. Determination

Based on the available information, the MDV application is:

- (•) Approved
- ( ) Request for more information
- ( ) Denied

Additional Justification (if needed):

Certification

Preparer Name	Title	
Matt Claucherty	Water Resources Management Specialist	
Signature of Preparer 		Date 6/19/2025

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