Elk Mound Public Noticed Permit Fact Sheet

General Information

Permit Number	WI-0023914-10-0
Permittee Name and Address	Village of Elk Mound, PO Box 188, Elk Mound WI 54739
Permitted Facility Name and Address	Elk Mound Wastewater Treatment Facility, S210 Holly Avenue, Elk Mound, WI
Permit Term	April 01, 2025 to March 31, 2030
Discharge Location	NE ¼, NE ¼, Section 34, T28N R11W, Town of Elk Mound, Dunn County, WI The outfall is located by the security fence on the east side of the facility.
Receiving Water	wetland tributary to Muddy Creek in Muddy and Elk Creeks of Chippewa River (Lower) in Dunn County
Stream Flow ($Q_{7,10}$)	0 cfs
Stream Classification	Limited Forage Fish, Non-public Water Supply
Discharge Type	Existing, Continuous
Annual Average Design Flow (MGD)	0.192 MGD
Industrial or Commercial Contributors	None
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; SS - Sanitary Sewage Collection System, D – Disinfection
Approved Pretreatment Program?	N/A

Facility Description

The Elk Mound Wastewater Treatment Facility treats domestic wastewater from the Village of Elk Mound. The annual average design flow is 0.192 million gallons per day (MGD) and had an actual annual average effluent flow of 0.079 MGD in 2024. Raw wastewater flows through a bar screen before being pumped into an oxidation ditch consisting of two channels providing secondary treatment. From the ditch wastewater flows to a secondary clarifier and through a UV disinfection chamber and ultimately flows over a cascade aerator into the adjacent wetland that is tributary to Muddy Creek. Stored sludge is landspread on Department approved agricultural fields. During periods of extremely high flow, excess wastewater can be pumped from the main pump station at the head of the plant into a 0.665 million-gallon storage tank. As flow recedes this wastewater is fed back into the system for treatment. No significant operational changes occurred during the last permit term. A facility upgrade is planned during this next permit term that includes an influent flow meter, mechanical influent screen, sludge storage tank and pumping equipment. Electrical upgrades and SCADA system improvements will also take place. Upgrades for phosphorus removal will include a new selector tank, submerged mixing equipment and chemical dosing equipment. The permittee will be required to seasonally disinfect their effluent to meet new effluent E coli limits.

Substantial Compliance Determination

Enforcement During Last Permit: No enforcement actions were taken against the permittee in the previous permit term.

After a desktop review of all discharge monitoring reports, CMARs, land application reports and a site visit on 5/14/2024 the Elk Mound Wastewater Treatment Facility has been found to be in substantial compliance with their current permit.

Compliance determination entered by Logan Rubeck on 6/13/2024.

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 flow is not measured at the influent. Flow is measured but it does not include wastewater that is pumped to the storm storage tank as this is done prior to the influent meter.	Representative influent samples shall be collected after the raw sewage pumps.
002	Effluent to the wetland tributary to Muddy Creek: 0.079 MGD (2024)	Representative composite effluent samples shall be collected after the final clarifier prior to UV disinfection and grab samples shall be collected from the effluent discharge cascade after UV disinfection.
003	Land application of sludge: 12 dry US tons annual average	Representative composite sludge samples shall be collected from the outlet pipe of the sludge storage tank and monitored for Lists 1, 2, 3 & 4 and PFAS annually, and once in 2026 for PCBs.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- AFTER RAW SEWAGE PUMPS

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit:

No changes.

1.1.2 Explanation of Limits and Monitoring Requirements

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

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 002- DISCHARGE FROM FINAL CLARIFIER

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Daily Max	30 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	15 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Daily Max	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	3/Week	24-Hr Flow Prop Comp	
pH Field	Daily Min	6.0 su	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Dissolved Oxygen	Daily Min	4.0 mg/L	Daily	Grab	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	8.1 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies April - May
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.2 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies April - May
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	5.6 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies June - Sept
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.2 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies June - Sept
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	31 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies Oct - March
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	12 mg/L	3/Week	24-Hr Flow Prop Comp	Limit applies Oct - March
E. coli		#/100 ml	Weekly	Grab	Monitoring only May through September annually until the final limit goes into effect per the Effluent Limitations for E. coli Schedule.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit Effective May through September annually per the Effluent Limitations for E. coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit & monitoring apply May-Sept. See the E. coli Percent Limit section in permit. Enter the result in the DMR on the last day of the month.
Copper, Total Recoverable	Daily Max	16 ug/L	Monthly	24-Hr Flow Prop Comp	Copper samples shall be collected at the same time as a quarterly hardness sample and a scheduled WET test.
Copper, Total Recoverable	Weekly Avg	11 ug/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Monthly Avg	11 ug/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable	Daily Max	0.16 lbs/day	Monthly	Calculated	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Zinc samples shall be collected at the same time as a quarterly hardness sample and a scheduled WET test.
Hardness, Total as CaCO3		mg/L	Quarterly	24-Hr Flow Prop Comp	A quarterly hardness sample shall be collected at the same time as monthly copper & zinc samples.
Phosphorus, Total	Monthly Avg	5.5 mg/L	3/Week	24-Hr Flow Prop Comp	This is an interim limit effective through 05/31/2028. See the MDV/Phosphorus subsections in permit and phosphorus schedules.
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	This is an interim MDV limit effective 06/01/2028. See the MDV/Phosphorus subsections in permit and phosphorus schedules.
Phosphorus, Total		lbs/month	Monthly	Calculated	Report the total monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See Standard Requirements for 'Appropriate Formulas' to calculate the Total Monthly Discharge in lbs/month.
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	Monitoring required annually in specific quarters. See Nitrogen Series Monitoring section in permit. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	See WET testing section in permit
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	

2.1.1 Changes from Previous Permit

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

- **Flow-** The sample frequency for flow has changed from "continuous" to "daily" for eDMR reporting purposes.
- **E. coli-** *Escherichia coli* (*E. coli*) monitoring and limits added, along with a compliance schedule to meet the limits
- **Copper –** Copper limits reduced, copper variance removed
- **Zinc** – Zinc limits removed, monitoring remains at a quarterly frequency
- **Phosphorus MDV** - The permittee has applied for a multi-discharger variance (MDV) for phosphorus for this permit term and the application has been approved by the Department. A monthly average MDV interim limit of 1.0 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 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.
- **Chronic WET Testing** – addition of chronic WET testing three times during the permit term
- **Total Nitrogen Monitoring (TKN, N02+N03 and Total N)-** Annual monitoring is required in specific quarters as outlined in the permit.

2.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo written by Ben Hartenbower, "Water Quality-Based Effluent Limitations for the Elk Mound Wastewater Treatment Facility WPDES Permit No. WI-0023914", dated November 22, 2024.

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. After consideration, the only change in monitoring frequency is the reduction in the zinc frequency from monthly to quarterly.

Expression of Limits- In accordance with the federal regulation 40 CFR 122.45(d) and s. NR 205.065, Wis. Adm. Code, limits in this permit are to be expressed as weekly and monthly average whenever practicable.

BOD, TSS, pH and DO: Categorical limits and WQBELs are included in the permit as outlined in ch. NR 210, Wis. Adm. Code. The effluent limitations for BOD5, Total Suspended Solids (TSS) and pH are carried over from the previous

permit and are not subject to change at this time because the receiving water characteristics have not changed. The monitoring frequency for all these parameters increased in order to effectively characterize the effluent quality and variability, and to best determine compliance with effluent limitations.

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 (6-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 5.5 mg/L as an average monthly limit. The limit was derived using DMR data from 03/01/2021 – 02/29/2024.

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; 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.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N)- The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019. Testing is required annually; see permit for specific quarters.

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Pursuant to s. NR 106.98(3)(b), Wis. Adm. Code, the department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the permit was drafted, the department has determined the permittee does not need to sample for PFOS or PFOA as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
003	B	Liquid	Fecal coliform and aerobic digestion	pH adjustment	Land application	8.3
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

3.1 Sample Point Number: 003- LIQUID SLUDGE

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

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Once in 2026
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Once in 2026
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

3.1.1 Changes from Previous Permit:

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

PFAS –Monitoring is required annually pursuant to NR 204.06(2)(b)9., Wis. Adm. Code.

3.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). 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).

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS."

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

4 Schedules

4.1 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 E. coli including, but not limited to, selected test method and location of sampling.	05/21/2025
Operational Evaluation Report: The permittee shall prepare and submit an Operational Evaluation Report to the Department for review and approval. The report shall include an evaluation of collected effluent data and proposed operational improvements that will optimize efficacy of disinfection at the treatment plant during the period prior to complying with final E. coli limitations and, to the extent possible, enable compliance with the final E. coli limitations. The report shall include a plan and schedule for implementation of the operational improvements. These improvements shall occur as soon as possible, but not later than 04/30/2026. The report shall state whether the operational improvements are expected to result in compliance with the final E. coli limitations. The permittee shall implement the operational improvements in accordance with the approved plan and schedule specified in the Operational Evaluation Report and in no case later than 04/30/2026. If the Operational Evaluation Report concludes that the operational improvements are expected to result in compliance with the final E. coli limitations, the permittee shall comply with the final E. coli limitations by 04/30/2026 and the permittee is not required to comply with subsequent milestones identified below in this compliance schedule ('Submit Facility Plan', 'Final Plans and Specifications', 'Treatment Plant Upgrade to Meet Limitations', 'Construction Upgrade Progress Report', 'Complete Construction', 'Achieve Compliance'). FACILITY PLAN - If the Operational Evaluation Report concludes that operational improvements alone are not expected to result 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. If the Department disagrees with the conclusion of the report and determines that the permittee can achieve final E. coli limitations using the existing treatment system with only operational improvements, the Department may reopen and modify the permit to include an implementation schedule for achieving the final E. coli limitations sooner than 04/30/2029.	11/30/2025

Submit Facility Plan: If the Operational Evaluation Report concluded that the permittee cannot achieve final E. coli limitations with operational improvements alone, the permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2026
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.	03/31/2027
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.	09/30/2027
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	09/30/2028
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	03/31/2029
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	04/30/2029

Explanation of Schedule: 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.

4.2 Phosphorus Multi-Discharger Variance Interim Limit (1.0 mg/L)

The permittee shall comply with the 1.0 mg/L MDV interim effluent limit by the end of this compliance schedule.

Required Action	Due Date
Submit Plans & Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Wis. Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with the interim phosphorus effluent limit and a schedule for completing construction of the upgrades by the 'Complete Construction' date specified below.	12/31/2025
Initiate Treatment Plant Upgrade: Upon approval of the final construction plans and schedule by the Department and pursuant to s. 281.41, Wis. Stats., the permittee shall initiate construction of the treatment plant upgrades in accordance with the approved plans and specifications.	06/30/2026
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	06/30/2027
Complete Construction and Achieve Compliance: The permittee shall complete construction and achieve compliance with the phosphorus interim effluent limit of 1.0 mg/L. The limit becomes effective 06/01/2028.	05/31/2028

Explanation of Schedule: Subsection 283.16(6), Wis. Stats., establishes required interim phosphorus effluent limits that must be met for multi-discharger variance (MDV) eligibility. Subsection 283.16(6)(am), Wis. Stats., allows a technology based phosphorus limit of 1.0 mg/L as the MDV interim limit if a permittee certifies that its treatment facility cannot achieve compliance with the MDV interim limit without a major facility upgrade. The permittee qualifies for a 1.0 mg/L total phosphorus MDV interim limit and the schedule above provides the permittee with time to comply with that limit.

4.3 Phosphorus Schedule - Optimization Plan

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

Required Action	Due Date
Optimization Plan: The permittee shall prepare an Optimization Plan and submit it for Department approval. The plan shall include an evaluation of collected effluent data, possible source reduction measures and operational improvements to optimize performance to control phosphorus discharges. The plan shall contain a schedule for implementation of the measures and improvements. Once the plan is approved by the Department, the permittee shall take the steps called for in the Optimization Plan and follow the schedule of implementation as approved.	03/31/2026
Progress Report #1: Submit a progress report on optimizing removal of phosphorus.	03/31/2027
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	03/31/2028
Progress Report #3: Submit a progress report on optimizing removal of phosphorus. This schedule item is contingent upon continued federal authorization of the MDV. See "MDV Reopener Clause" in the Surface Water section of this permit.	03/31/2029
Progress Report #4: Submit a progress report on optimizing removal of phosphorus. This schedule item is contingent upon continued federal authorization of the MDV. See "MDV Reopener Clause" in the Surface Water section of this permit.	03/31/2030

Explanation of Schedule: Per s. 283.16(6)(a), Wis. Stats. the Department may include a requirement that the permittee optimize the performance of a point source in controlling phosphorus discharges, which may be necessary to achieve compliance with multi-discharger variance interim limits. This compliance schedule requires the permittee to prepare an optimization plan with a schedule for implementation and submit it for Department approval. The permittee shall take the steps called for in the optimization plan and submit annual progress reports on optimizing the removal of phosphorus.

4.4 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 County Payment Schedule: Subsection 283.16(6)(b), Wis. Stats., requires permittees that have received approval for the multi-discharger variance (MDV) to implement a watershed project that is designed to reduce 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).

4.5 Operator Certification

Required Action	Due Date
Operator Certification- Disinfection Subclass: The permittee shall have an operator in charge with the proper certification for Disinfection (D Subclass) by the due date. Within 30 days of submitting the experience form (3400-066A) and receiving certification, the permittee shall notify the department in writing of the certified operator's name and certification number.	03/31/2026

Explanation of compliance schedule for Operator Certification- Disinfection: This is the first permit term that the permittee will be required to meet disinfection requirements and *E. coli* limits, therefore they will need time to obtain certification in the disinfection subclass and complete the proper amount of experience.

Other Comments

Publishing newspaper: Leader Telegram, 701 S Farwell Street, PO Box 4001, Eau Claire, WI, 54702-4001

Attachments

- Water Quality Based Effluent Limits written by Ben Hartenbower, "Water Quality-Based Effluent Limitations for the Elk Mound Wastewater Treatment Facility WPDES Permit No. WI-0023914", dated November 22, 2024.
- MDV Evaluation Checklist, completed by Matt Claucherty, dated 08/20/2024
- MDV Conditional Approval Letter, completed by Matt Claucherty, dated 08/20/2024

Justification Of Any Waivers From Permit Application Requirements

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

Prepared By: Holly Heldstab, Wastewater Specialist **Date:** 02/10/2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: November 22, 2024

TO: Holly Heldstab – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the Elk Mound Wastewater Treatment Facility WPDES Permit No. WI-0023914

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 Elk Mound Wastewater Treatment Facility in Dunn County. This municipal wastewater treatment facility (WWTF) discharges to a wetland tributary to Muddy Creek, located in the Muddy and Elk Creeks Watershed in the Lower Chippewa River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 002:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD_5	30 mg/L			15 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 April - May June - September October - March			 8.1 mg/L 5.6 mg/L 31 mg/L	 3.2 mg/L 2.2 mg/L 12 mg/L		1
E. Coli				126 #/100 mL geometric mean		3
Copper	16 µg/L, 0.16 lbs/day		**11 µg/L**	**11 µg/L**		4
Zinc						2
Hardness						5
Phosphorus LCA Interim Limit HAC Interim Limit Final WQBEL				 5.5 mg/L 1.0 mg/L 0.225 mg/L	 0.075 mg/L	6
TKN, Nitrate+Nitrite, and Total Nitrogen						7
Acute WET						8
Chronic WET						8,9

Footnotes:

1. No changes from the current permit.
2. Monitoring only.

3. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. Hardness monitoring is recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.
6. Under the phosphorus MDV, a level currently achievable (LCA) interim limit of 5.5 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 1.0 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.
7. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
8. Two acute and three chronic WET tests are recommended in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).
9. 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% and the dilution water used in WET tests conducted on Outfall 002 shall be a grab sample collected from Muddy Creek.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Benjamin Hartenbower at (715) 225-4705 or Benjamin.Hartenbower@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Thermal Table, & Map

PREPARED BY: _____ Date: 11/22/2024

Benjamin Hartenbower, PE,
Water Resources Engineer

E-cc:

Logan Rubeck, Wastewater Engineer – WCR/Eau Claire
Geisa Thielen, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Chris Willger, Water Quality Biologist – WCR/Eau Claire
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for the Elk Mound Wastewater Treatment Facility WPDES Permit No. WI-0023914

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description:
The Elk Mound Wastewater Treatment Facility consists of a raw pump station, overflow/high flow equalization basin, (2) channel oxidation ditch, secondary clarifier, and cascade aeration prior to discharge to a wetland that runs to Muddy Creek.

Attachment #3 is a map of the area showing the approximate location of Outfall 002.

Existing Permit Limitations
The current permit, which expired on September 30, 2024, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1,2
BOD_5	30 mg/L			15 mg/L		1,3
TSS	30 mg/L			20 mg/L		1,3
pH	9.0 s.u.	6.0 s.u.				1
Dissolved Oxygen		4.0 mg/L				1,3
Ammonia Nitrogen April - May June - September October - March			 8.1 mg/L 5.6 mg/L 31 mg/L	 3.2 mg/L 2.2 mg/L 12 mg/L		
Copper	34 µg/L		24 µg/L			4
Zinc	120 µg/L, 0.51 lbs/day		**120 µg/L**	**120 µg/L**		5
Phosphorus Interim Final WQBEL				 7.70 mg/L 0.225 mg/L	 0.075 mg/L	6
Acute WET						7

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. Monitoring only.
3. These limits are based on the Limited Forage Fish (LFF) community of the immediate receiving water as described in s. NR 104.02(3)(a), Wis. Adm. Code.
4. Copper variance interim limit.

5. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
6. A compliance schedule is in the current permit to meet the final WQBEL by September 30, 2026.
7. Acute WET testing required: Jan - March 2021 and July - Sept 2023.

Receiving Water Information

- Name: wetland tributary to Muddy Creek
- Waterbody Identification Code (WBIC): 2118300
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited Forage Fish (LFF), non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code:

  $7\text{-}Q_{10} = 0$ cfs

  $7\text{-}Q_{2} = 0$ cfs

  Harmonic Mean Flow = 0 cfs
- Hardness = 103 mg/L as $CaCO_3$. This value represents the geometric mean effluent data. 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: None

Effluent Information:

- Design Flow Rates(s):

  Annual Average = 0.192 MGD (Million Gallons per Day)

  Peak daily = 1.173 MGD (estimated)

  For reference, the actual average flow from October 2019 to August 2024 was 0.070 MGD.
- Hardness = 103 mg/L as $CaCO_3$. This value represents the geometric mean of 4 effluent samples collected from 10/31/2023 to 11/09/2023.
- Acute dilution factor used in accordance with s. NR 106.06 (3) (c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water Source: Domestic wastewater with water supply from wells.
- Additives: Aluminum Sulfate or Ferric Chloride are proposed additives for phosphorus treatment.
- 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 Chloride and Hardness. The permit-required monitoring for Ammonia Nitrogen, Copper, Zinc, and Phosphorus from October 2019 to August 2024 is used in this evaluation.

Attachment #1

Chemical Specific Effluent Data at Outfall 002

	Copper µg/L	Zinc µg/L
1-day P_{99}	16.84	101.83
4-day P_{99}	10.70	68.66
30-day P_{99}	6.01	51.58
Mean	3.97	43.31
Std	3.52	18.15
Sample size	59	59
Range	<3 - 18	18 - 78

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

Chemical Specific Effluent Data at Outfall 002

Sample Date	Chloride mg/L
10/31/2023	62
11/03/2023	68
11/06/2023	72
11/09/2023	71
mean	68

Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.".

The following table presents the average concentrations and loadings at Outfall 002 from October 2019 to August 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6):

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	4.5 mg/L*	
TSS	3.5 mg/L*	
pH	6.53 s.u.	
Dissolved Oxygen	7.32 mg/L	
Ammonia Nitrogen	0.18 mg/L*	
Copper	3.97 µg/L*	
Zinc	43.31 µg/L	0.03 lbs/day
Phosphorus	3.50 mg/L	

*Results below the level 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 the Elk Mound Wastewater Treatment Facility.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)
RECEIVING WATER FLOW = 0.00 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	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340		340	68	1		
Cadmium	103	10.7	0.033	10.7	2.1	<2		
Chromium (+3)	103	1854		1854	371	<3		
Copper	103	16.0	1.860	16.0			**16.8**	**18.0**
Lead	103	110	0.841	110	22	<1		
Nickel	103	483		483	97	<8		
Zinc	103	124	2.350	124			101.83	78.00
Chloride		757	14.7	757	151	68		72

* * 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 = 0.00 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	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Arsenic		152		152	30	1	
Cadmium	103	2.5	0.033	2.5	0.5	<2	
Chromium (+3)	103	136		136	27	<3	
Copper	103	10.7	1.860	10.7			10.7
Lead	103	29	0.841	29	6	<1	
Nickel	103	54		54	11	<8	
Zinc	103	124	2.350	124			68.66
Chloride		395	14.7	395	79	68	

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 = 0.00 cfs (¼ of the Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370.0	0.033	370.0	74.0	<2	
Chromium (+3)	3818000		3818000	763600	<3	
Lead	140	0.841	140	28	<1	
Nickel	43000		43000	8600	<8	

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 0.00 cfs (¼ of the Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Arsenic	13.3		13.3	2.7	1	

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

Conclusions and Recommendations: Based on a comparison of the effluent data and calculated effluent limitations, limits are required for Copper.

Copper – Considering available effluent data from the current permit term (October 2019 to August 2024), the 30-day P_{99} concentration is 6.0 µg/L, the 4-day P_{99} concentration is 10.7 µg/L, and the 1-day P_{99} concentration is 16.8 µg/L, with a maximum concentration of 18.0 µg/L. The maximum effluent concentration and the 1-day P_{99} of the effluent data exceed the calculated daily maximum limit, therefore concentration and mass limits, as well as monthly monitoring, are required.

The acute mass limitation of 0.16 lbs/day is based on the concentration limit and the peak daily flow rate of 0.117 MGD (16.0 µg/L * 1.173 MGD * 8.34/1000) in accordance with s. NR 106.07(2)(a), Wis. Adm. Code.

Quarterly hardness monitoring is also recommended because of the relationship between hardness and daily maximum limits based on acute toxicity criteria.

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

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

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

The calculated weekly average copper limit is more restrictive than the daily maximum. Therefore, **weekly and monthly average copper limits of 11 µg/L** are recommended in the permit.

Zinc – Considering available effluent data from the current permit term (October 2019 to August 2024), the 30-day P_{99} concentration is 51.58 µg/L, the 4-day P_{99} concentration is 68.66 µg/L, and the 1-day P_{99} concentration is 101.83 µg/L, with a maximum concentration of 78.00 µg/L. These effluent concentrations are below the calculated WQBELs for Zinc, therefore no effluent limits are needed. To ensure that representative sample results are available at the next permit issuance, **monthly zinc monitoring is recommended.**

Since current treatment capability is expected to remain in place, the removal of zinc limits will not increase the concentration, level, or loading of zinc to the wetland tributary to Muddy Creek. Therefore, antidegradation would not be applicable. To be consistent with antibacksliding requirements, **the current limits may be removed** in accordance with s. NR 207.12(3)(b), Wis. Adm. Code.

PFOS and PFOA
The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98, Wis. Adm. Code. PFOS and PFOA were not detected in the water supply. Based on the annual design flow and lack of nondomestic contributions, it is unlikely that the effluent will contain PFOS or PFOA. **Therefore, monitoring is not recommended.** If information becomes available that indicates PFOS or PFOA may be present in the effluent, the monitoring requirements may change.

Mercury – The permit application did not require monitoring for mercury because the Elk Mound 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). A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from 2020 to 2023 was 0.15 mg/kg, with a maximum reported concentration of 0.30 mg/kg. Therefore, **no mercury monitoring is recommended at Outfall 002.**

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 weekly average and monthly average limits. 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.
- The maximum expected effluent pH has changed

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 = 0.411 and B = 58.4 for a Limited Forage fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 1797 sample results were reported from October 2019 to August 2024. The maximum reported value was 7.11 s.u. (Standard pH Units). The effluent pH was 7.03 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 6.98 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 6.97 s.u. Therefore, a value of 7.03 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.03 s.u. into the equation above yields an ATC = 35.14 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	70.27
1-Q_{10}	35.14

The 1-Q_{10} method yields the most stringent limits for the Elk Mound Wastewater Treatment Facility.

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

The ammonia limit calculation also warrants evaluation of weekly and monthly average limits based on chronic toxicity criteria for ammonia, since those limits relate to the assimilative capacity of the receiving water.

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 Forage Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 1.0,
C = the minimum of 3.09 or $3.73\times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Present), or
C = $3.73\times 10^{(0.028 \times (25 - T))}$ – (Early Life Stages Absent), and
T = the temperature (ºC) of the receiving water – (Early Life Stages Present), or
T = the maximum of the actual temperature (ºC) and 7 - (Early Life Stages Absent)

The 4-day criterion is equal to the 30-day criterion multiplied by 2.5. The 4-day criteria are used in a mass-balance equation with the 7-Q_{10} (4-Q3, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q_5 (estimated as 85% of the 7-Q_2 if the 30-Q_5 is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 ºC, 25% of the flow is used if the Temperature < 11 ºC, and 50% of the flow is used if the Temperature ≥ 11 ºC but < 16 ºC.

Section NR 106.32 (3), Wis. Adm. Code, provides a mechanism for less stringent weekly average and monthly average effluent limitations when early life stages (ELS) of critical organisms are absent from the receiving water. This applies only when the water temperature is less than 14.5 ºC, during the winter and spring months. Based on a review of the DNR Fisheries database, burbot, an early spawning species, are not believed to be present in wetland tributary to Muddy Creek. So "ELS Absent" criteria apply from October through March, and "ELS Present" criteria will apply from April through September for a LFF classification.

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

Weekly and Monthly Ammonia Nitrogen Limits – LFF

		April & May	June-September	October-March
Effluent Flow	Qe (MGD)	0.019	0.019	0.019
Background Information	7-Q_{10} (cfs)	0.00	0.00	0.00
	7-Q_2 (cfs)	0.00	0.00	0.00
	Ammonia (mg/L)	0.07	0.07	0.14
	Temperature (°C)	15.0	20.6	12.8
	pH (s.u.)	7.67	8.07	7.46
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	0.00	0.00	0.00
	Reference Monthly Flow (cfs)	0.00	0.00	0.00
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	11.79	7.01	14.29
	Early Life Stages Absent	27.11	11.27	37.92
	30-day Chronic			
	Early Life Stages Present	4.71	2.80	5.71
	Early Life Stages Absent	10.84	4.51	15.17
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	12	7.0	
	Early Life Stages Absent			38
	Monthly Average			
	Early Life Stages Present	4.7	2.8	
	Early Life Stages Absent			15

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from October 2019 to August 2024, with those results being compared to the calculated limits to determine the need to include ammonia limits in the Elk Mound Wastewater Treatment Facility permit for the respective month ranges.

Attachment #1

Ammonia Nitrogen Effluent Data

Ammonia Nitrogen mg/L	April & May	June-September	October-March
1-day P_{99}	4.3	2.0	1.8
4-day P_{99}	2.3	1.0	1.0
30-day P_{99}	1.0	0.4	0.4
Mean*	0.3	0.2	0.1
Std	1.5	0.6	0.8
Sample size	129	250	389
Range	<0.1 - 5.9	<0.1 - 3.2	<0.01 - 5.2

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

Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits.

The permit currently has weekly average and monthly average limits. 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, **the current limits and monitoring for ammonia nitrogen are recommended to continue.**

Final Ammonia Nitrogen Limits

	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
April & May		8.1	3.2
June-September		5.6	2.2
October-March		31	12

Attachment #1
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.

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.

The Elk Mound Wastewater Treatment Facility had previously been exempted from disinfection based on the limited aquatic life or limited forage fish community classification of the receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (not on the water quality classifications - i.e., limited forage fish, limited aquatic life - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for wetland tributary to Muddy 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.

These limits are required during May through September. No changes are recommended to the required disinfection season.

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 Elk Mound Wastewater Treatment Facility does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance to s. NR 217.04(1)(a)1, Wis. Adm. Code, and therefore a technology-based limit is not required.

Annual Average Mass Total Phosphorus Loading

Attachment #1

Month	Monthly Avg. mg/L	Total Flow MG/month	Total Phosphorus lb./mo.
Sep 2023	2.37	1.43	28.35
Oct 2023	3.46	2.10	60.46
Nov 2023	2.95	1.92	47.22
Dec 2023	6.04	1.38	69.66
Jan 2024	2.36	1.39	27.32
Feb 2024	5.84	1.31	63.79
Mar 2024	5.37	1.52	68.22
Apr 2024	2.97	2.59	64.08
May 2024	2.27	3.34	63.17
Jun 2024	1.58	4.91	64.63
Jul 2024	2.11	4.02	70.65
Aug 2024	1.81	3.02	45.55
		Average =	**56.09**

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
Where total flow is the sum of the actual (not design) flow (in MGD) for that month

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

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

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

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

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

Where:

WQC = 0.075 mg/L for wetland tributary to Muddy Creek.
Qs = 100% of the 7-Q_2 of 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 = 0.192 MGD = 0.297 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 October 2019 to August 2024.

	Phosphorus mg/L
1-day P_{99}	8.18
4-day P_{99}	5.53
30-day P_{99}	4.16
Mean	3.50
Std	1.46
Sample size	768
Range	0.63 - 11.1

Reasonable Potential Determination

Since the 30-day P_{99} of reported effluent total phosphorus data is greater than the calculated WQBEL, the discharge has reasonable potential to cause or contribute to an exceedance of the water quality criterion. Therefore, a WQBEL is required.

Limit Expression

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

Multi-Discharge Variance Interim Limit

With the permit application, the Village of Elk Mound has 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. A review of effluent phosphorus data indicates that the Elk Mound Wastewater Treatment Facility will be unable to comply with the 0.8 mg/L phosphorus limits required under s. 283.16 (6) (a) 1., Wis. Stats. Therefore, the recommended interim limit, pursuant to s. 283.16 (6) (am), Wis. Stats., is 1.0 mg/L as a monthly average. A compliance schedule may be appropriate to meet this interim limit but compliance with **1.0 mg/L shall be no later than the end of the reissued permit.**

The effluent data indicates that 4-day P_{99} value of 5.53 mg/L is a level currently achievable (LCA) for the discharge. A **limit of 5.5 mg/L as a monthly average** 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 chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from October 2019 to August 2024.

The table below summarizes the maximum temperatures reported during monitoring from January 2020 to October 2024.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (c)	Daily Maximum Effluent Limitation (°F)
JAN	29	33	54	78
FEB	37	41	54	79
MAR	31	40	57	80
APR	38	40	63	81
MAY	56	60	70	84
JUN	61	63	77	85
JUL	65	68	81	86
AUG	66	68	79	86
SEP	70	70	73	85
OCT	61	61	**63**	83
NOV	59	59	**54**	80
DEC	53	53	54	79

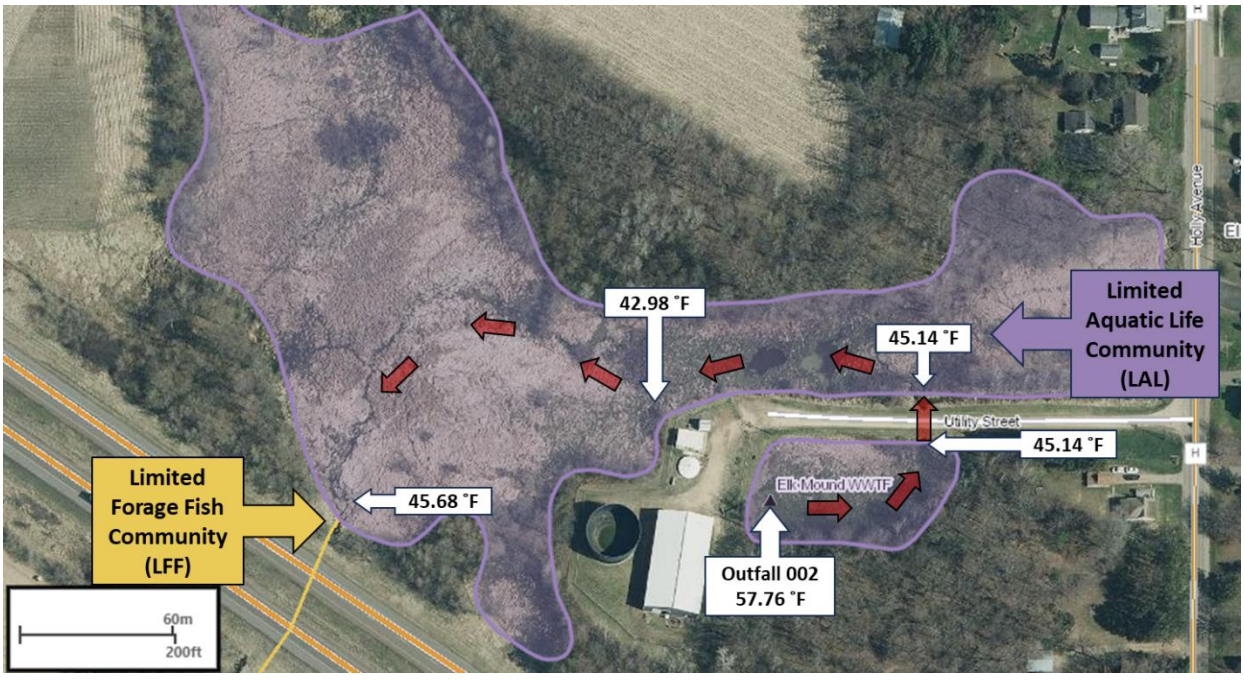
Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  (a) The highest recorded representative daily maximum effluent temperature
  (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. The months in which limitations are recommended are shown in bold. Based on this analysis, the October and November sub−lethal limitations for the Limited Forage Fish Community would be exceeded at the outfall location.

However, a site investigation performed by DNR staff on November 14, 2024, demonstrates that elevated thermal loading from the effluent remains below the applicable temperature criteria for a Limited Aquatic Life Community and rapidly dissipates to ambient temperatures before reaching the downstream Limited Forage Fish Community classification change. **Therefore temperature limits and monitoring are not recommended.**



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 LC50 (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:

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

Where:

Qe = annual average flow = 0.192 MGD = 0.297 cfs
f = fraction of the Qe withdrawn from the receiving water = 0
Qs = ¼ of the 7-Q_{10} = 0.00 cfs ÷ 4 = 0.00 cfs

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual*, 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.

- 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.

Attachment #1

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	Algae (IC_{50})	Pass or Fail?	Use in RP?	
09/07/2006	>100	>100	Pass	Yes	>100	>100		Pass	Yes	
02/24/2021	>100	>100	Pass	Yes						
08/29/2023	>100	>100	Pass	Yes						

- 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.

  Acute Reasonable Potential = [(TUa effluent)(B)]
  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.

Attachment #1

WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not Applicable. **0 Points**	IWC = 100% **15 Points**
Historical Data	Two tests used to calculate RP. No tests failed. **0 Points**	One tests used to calculate RP. No tests failed. Data not available in past 5 years. **5 Points**
Effluent Variability	BOD_5 and TSS exceedances. **5 Points**	Same as Acute. **5 Points**
Receiving Water Classification	<4 miles to WWSF (5 pts) **5 Points**	Same as Acute. **5 Points**
Chemical-Specific Data	Reasonable potential for Copper limits based on ATC; (5 pts) Ammonia, Arsenic, Zinc, and Chloride detected. (3 pts) Additional Compounds of Concern: none **8 Points**	No reasonable potential for limits based on CTC. Ammonia nitrogen limit carried over from the current permit. Ammonia, Arsenic, Zinc, and Chloride detected. (3 pts) Additional Compounds of Concern: none **3 Points**
Additives	No biocides and one water quality conditioner (1 pt) added. Permittee has proper P chemical SOPs in place. **1 Point**	All additives used more than once per 4 days. **1 Point**
Discharge Category	No 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:	**19 Points**	**34 Points**
Recommended Monitoring Frequency (from Checklist):	2 tests during permit term	3 tests 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, two acute and three chronic WET tests are recommended in the reissued permit. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Attachment #2

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Elk Mound WWTF		**7-Q_{10}:**	0.00	cfs		
Outfall(s):	002		**Dilution:**	25%		**Start:**	01/01/20	10/01/19
Date Prepared:	10/17/2024		**f:**	0		**End:**	10/24/24	08/31/24
Design Flow (Qe):	0.019	MGD	**Stream type:**	Limited forage fish community			
Storm Sewer Dist.	0	ft	**Qs:Qe ratio:**	0.0	:1		
			Calculation Needed?	YES			

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	37	54	78	0.00	0.094	0.111	0	42	50	54	78
FEB	39	54	79	0.00	0.053	0.063	0	45	49	54	79
MAR	43	57	80	0.00	0.174	0.277	0	44	47	57	80
APR	50	63	81	0.00	0.293	0.367	0	49	51	63	81
MAY	59	70	84	0.00	0.194	0.213	0	56	58	70	84
JUN	64	77	85	0.00	0.283	0.413	0	60	65	77	85
JUL	69	81	86	0.00	0.166	0.183	0	67	68	81	86
AUG	68	79	86	0.00	0.117	0.160	0	66	66	79	86
SEP	63	73	85	0.00	0.092	0.104	0	66	66	73	85
OCT	55	63	83	0.00	0.205	0.430	0	64	64	63	83
NOV	46	54	80	0.00	0.124	0.151	0	56	56	54	80
DEC	40	54	79	0.00	0.082	0.109	0	50	50	54	79

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Elk Mound WWTF

Legend

Permits

Surface Water Outfalls

Basemaps

Imagery

Latest Leaf Off Imagery

Red: Band_1

Green: Band_2

Blue: Band_3

Notes

Service layer credits:
WI Dept. of Natural Resources, Division of Water

1:1,242

0 300 600 ft

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Date Printed: 10/16/2024

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WISCONSIN DEPT. OF NATURAL RESOURCES

8/20/2024

Mark Levra
P O Box 188
Elk Mound, WI 54739

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Tributary to Muddy Creek in Dunn County
Permittee: Village of Elk Mound, WPDES WI-0023914

Dear Mr. Lerva:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for the Elk Mound Wastewater Treatment Facility in an application dated 7/24/2024. 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: Tim Stockman, Davy Engineering
Logan Rubeck, WDNR
Holly Heldstab, WDNR
Tim Elkins, EPA Region 5
Micah Bennett, 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 Elk Mound

WPDES Permit Number	County
WI- 0 | 0 | 2 | 3 | 9 | 1 | 4	Dunn

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:	4	*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	4.4	(•) 30-day P99 ( ) Other, specify:	( ) Yes (•) No, why not: Application used 2023 data only	*DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.*

Save

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)(a), Wis. Stats.

Target value = 0.2 mg/L

Facility upgrades will be required in the next permit term to meet the interim limit

Provide Rationale:

Total phosphorus effluent data from the past three years (3/1/2021 - 2/29/2024, n=469) yield a 30-day p99 value of 4.4 mg/L. This represents a level currently attainable. Facility upgrades and associated schedule will be required in the next permit term to meet the 0.8 mg/L interim limit consistent with highest attainable condition. The interim limit will be reevaluated in future permit terms if another variance is applied for. The WQBEL memo may recommend a limit that differs from above.

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.

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:	$ 5,926,850.00 Capital costs from final compliance alternatives plan	*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, dated September 2023, was prepared by Davy Engineering. The Plan investigates solutions to the low 0.075 mg/L phosphorus WQBEL. Outfall relocation and land treatment were evaluated and deemed not feasible due to location and lack of suitable land. Adaptive management was evaluated but not considered practical due to magnitude of offset and level of staffing to coordinate a watershed effort. Water quality trading is actively being pursued, and the Plan provides a number of potential trading partners. At the time of MDV application, sufficient credits are NOT available for water quality trading or third-party MDV offset options. A tertiary filtration upgrade is evaluated and provided a site-specific cost estimate, which is used in the economic demonstration below.

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

Comments on economic demonstration:

The MDV application indicates phosphorus compliance costs of $6.8M. A summary table in the final compliance alternatives plan shows capital costs for dual stage reactive filtration at $5,926,850 with O&M increases at $23,665.00 (table 9.4). Based on table 11.1, a number of unrelated/deferred maintenance upgrades are included in the cost estimate to arrive at $6.8M captial cost total. For the purposes of a variance evaluation, not all costs are considered. A more conservative approach is to use only sludge storage, effluent filtration, and engineering/admin/contingency items in Table 11.1, which total to $4,751,100. Assuming a 20-year CWFP loan at 2.1% interest, annual payments total to $291,129. With O&M, total annual costs are $314,794. Residential use rate is 60%, therefore the residential share is $188,876.40. Divided amongst 414 resident households, the per-user cost increase is $456.22. Current sewer rates are $567 per year. Future sewer rates would be $1,023.22 annually. This value is 1.4% of Elk Mound's $73,000 median household income. In Dunn County with a secondary indicator score of 4, sewer rates at 1% of MHI meet the primary screener. The applicant has met the primary screener.

15. What watershed option was selected?

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

Section 4. Watershed Plan Review

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

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

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

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

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

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

Comments:

Section 5. Payment to the County(ies)

24. At this time, the appropriate per pound payment is: $ 64.75

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

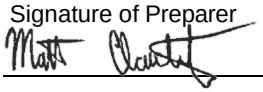
Section 6. Determination

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 8/20/2024

A copy of this completed checklist should be saved in SWAMP, and a notification of the decision should be sent to the Phosphorus Implementation Coordinator.