Permit Fact Sheet

General Information

Permit Number:	WI-0036706-11-0	
Permittee Name:	Village of Clayton	
Address:	Box 63 111 Clayton Avenue W	
City/State/Zip:	Clayton WI 54004-0091	
Discharge Location:	Approx. 2,500 feet west of the Final Pond of the facility located at North Prentice Street, Clayton WI, where the discharge meets the intermittent tributary (SE¼, NE¼ of section 15; T33N-R15W). North Prentice Street, Clayton WI	
Receiving Water:	Clayton Branch (an intermittent tributary to the South Branch of Beaver Brook) within the Beaver Brook watershed in the St. Croix River drainage basin in Polk County	
Wild Rice Impacts: *(no specific wild rice standards exist at this time)*	No impacts identified at this location. Wild rice beds have been found in the Apple River Flowage, but not near the mouth of Beaver Brook. The conclusion of no impact is based on the distance to any known rice habitat.	
StreamFlow ($Q_{7,10}$):	0.09 cfs	
Stream Classification:	Based on an investigation of the receiving water, the classification of Clayton Branch is a Warm Water Sport Fishery (WWSF). It is also a non-public water supply and within the ceded territory.	
Discharge Type:	Existing facility, primarily operating as a noncontinuous discharger March - December	
Design Flow(s)	Annual Average	0.105 MGD
Significant Industrial Loading?	None	
Operator at Proper Grade?	Yes	
Approved Pretreatment Program?	N/A	

Facility Description

The Village of Clayton owns and operates a domestic wastewater treatment system. The plant designed to treat 105,000 gallons per day, currently treats an average of 65,000 gallons per day. (June 2019 – June 2024). Treatment consists of an influent fine screen, chemical-feed phosphorus reduction system, four stabilization ponds and a recirculating gravel filter. Influent enters the main lift station through the fine screen. The chemical-feed is added prior to the primary treatment pond and gravity transferred to the secondary, tertiary and quaternary ponds. Within the primary and secondary ponds naturally occurring bacteria and organisms already present in the wastewater metabolize organic matter. The main purpose of the tertiary and quaternary ponds is holding water during the months when nitrification is inhibited by cold weather (January – February). Following the quaternary pond is the recirculating gravel filter. Water is distributed over three beds constructed of layers of gravel and sand and lined with a synthetic liner. Wastewater receives additional treatment by the biofilm attached to the gravel extending the period nitrification can occur and increasing total suspended solid removal. The water from the filters is sent back to the splitter tank and filtered again until treatment goals are met.

Solids produced during the treatment process are removed as needed to maintain facility performance and land-applied on WDNR-approved agricultural sites.

Substantial Compliance Determination

All conditions and standard requirements of the permit are being met. After a desktop review March 6, 2024, of all discharge monitoring reports, land application reports, CMARs, and annual phosphorus reports by Carson Johnson, WDNR, and an onsite inspection May 2, 2022 by Jordan Englebert, WDNR, the Village of Clayton has been found to be in substantial compliance with their current permit.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	INFLUENT An average of 0.065 MGD (June 2019 – June 2024)	Representative influent samples shall be collected from the main lift station.
003	SLUDGE Sludge was last removed September 1992. 55 tons is expected to be generated whenever another removal is required. (information from the applicant)	Samples of the lagoon sludge shall be collected at a point and in a manner that will yield sample results representative of the sludge being tested. Sample collection shall be taken at a time appropriate for the specific test.
004	EFFLUENT An average of 0.188 MGD (June 2019 – June 2024)	Representative effluent samples shall be collected from the splitter box prior to discharge.

1 Influent – Monitoring Requirements

Sample Point Number: 701- INFLUENT TO PLANT

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

Changes from Previous Permit:

Effluent limitations and monitoring requirements were re-evaluated for the proposed permit term and no changes were required in this permit section. Sampling requirements and frequencies are the same as the previous permit.

Explanation of Limits and Monitoring Requirements

The parameters are standard for minor municipalities, as are monitoring and frequency requirements for municipal wastewater treatment plants. Tracking of influent and effluent BOD5, and Suspended Solids concentrations are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code.

2 Surface Water - Monitoring and Limitations

Sample Point Number: 004- EFFLUENT DISCHARGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Total Daily	
BOD5, Total	Weekly Avg	5.0 mg/L	Weekly	Grab	Limit is effective May through October.
BOD5, Total	Weekly Avg	10 mg/L	Weekly	Grab	Limit is effective November through April.
BOD5, Total	Daily Max	30 mg/L	Weekly	Grab	Limit is effective June through August and December through February.
Suspended Solids, Total	Weekly Avg	10 mg/L	Weekly	Grab	
Suspended Solids, Total	Daily Max	30 mg/L	Weekly	Grab	Limit is effective June through August and December through February.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.8 mg/L	Weekly	Grab	Limit is effective May through October.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.7 mg/L	Weekly	Grab	Limit is effective November through April.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	8.3 mg/L	Weekly	Grab	Limit is effective May through October.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	16 mg/L	Weekly	Grab	Limit is effective November through April.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	Weekly	Grab	Enter the daily ammonia result on the eDMR and compare to the Nitrogen, Ammonia Variable Limit column to determine compliance.
Nitrogen, Ammonia Variable Limit		mg/L	Weekly	See Table	Using the daily pH result look up the applicable

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					ammonia limit in the "Ammonia Limitation" section and report the variable limit on the eDMR.
pH Field	Daily Max	9.0 su	Weekly	Grab	
pH Field	Daily Min	6.0 su	Weekly	Grab	
Dissolved Oxygen	Daily Min	7.0 mg/L	Weekly	Grab	
E. coli		#/100 ml	Weekly	Grab	Monitoring is required May through September 2025.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September annually per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.
Phosphorus, Total	Monthly Avg	1.4 mg/L	Weekly	Grab	INTERIM LIMIT through 12/31/2027. See the MDV (Multi-Discharger Variance) Requirements section and Phosphorus schedules for more information.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Weekly	Grab	INTERIM MDV LIMIT begins 1/1/2028. See the MDV (Multi-Discharger Variance) Requirements section and Phosphorus schedules for more information.
Phosphorus, Total		lbs/month	Monthly	Total Monthly	Report the total monthly phosphorus discharged in lbs/month on the last day of the month on the DMR. See

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Standard Requirements for 'Appropriate Formulas' to calculate the Total Monthly Discharge in lbs/month.
Phosphorus, Total		lbs/yr	Annual	Total Annual	Report the sum of the total monthly discharges for the calendar year on the Annual report form.
Temperature		deg F	Weekly	Multiple Grab	Monitoring is required during the 2026 calendar year.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	Grab	See the "Nitrogen Series Monitoring" section for more information.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	Grab	See the "Nitrogen Series Monitoring" section for more information.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Total Nitrogen = Total Nitrogen Kjeldahl (mg/L) + Nitrite +Nitrate Nitrogen (mg/L). See the "Nitrogen Series Monitoring" section for more information.

Changes from Previous Permit

Effluent limitations and monitoring requirements were re-evaluated for the proposed 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.

- A **Flow** limit is not included this permit term.
- **BOD_5** and **Total Suspended Solids** limits have been replaced by effluent limits as described in s. NR 104.02(3)(b), Wis. Adm. Code.
- A **Dissolved Oxygen** limit has been changed due to changes in the receiving water classification.
- The **Ammonia** variable daily maximum limit tables has been extended and the weekly and monthly average limits have changed
- ***E. coli*** monitoring, limits and schedule have been added to the permit.
- The permittee has applied for a **phosphorus multi-discharger variance (MDV)** for phosphorus for this permit term and the application has been approved by the Department. An interim limit and schedule have also been included.
- One year of **Temperature** monitoring is required in 2026 in preparation for the next permit issuance.
- Annual monitoring for the **Nitrogen Series** (nitrate +nitrite, total Kjeldahl nitrogen and total nitrogen) has been added to the permit.

Explanation of Limits and Monitoring Requirements

More information on categorical and water quality-based limits (WQBEL) is found in the "Water Quality-Based Effluent Limitations for the Village of Clayton (WI-0036706)" memo dated June 6, 2024.

Receiving Water Classification - To provide consistency in the application of limits across facilities and to appropriately protect aquatic life, the DNR is systematically reviewing stream classifications for waters that receive discharges from WPDES-permitted facilities. Reviews focus on sites where a permit is scheduled for reissuance and where questions have been identified regarding the appropriate receiving water's classification. Based on the survey conducted on September 11, 2023, it was determined that calculating limits based on a limited aquatic life (LAL) community is no longer protective of the existing or the attainable aquatic life community. The receiving water has been classified as a Warm Water Sport Fish (WWSF) community and effluent limitations have been recalculated using this updated use designation. For more information on the methods used to review stream classifications and calculate limits see the "Village of Clayton, Clayton Branch (WBIC 265100) to South Branch Beaver Brook (WBIC 2624400), Polk County" survey dated April 25, 2024, and the Water Quality-Based Effluent Limits memo.

Flow – In the previous permit issuance the facility was given variance limits for flow per s. NR 104.02(4)(c), Wis. Adm. Code. Re-evaluation has determined that the permittee doesn't meet all required conditions and a variance is not applicable.

BOD_5 - Due to the change in receiving water designation the categorical limits found in NR 210.05 are no longer considered adequate to protect water quality. Limits were recalculated using the 26-Pound equation. This is a simplified method that is used when site-specific information is not available. It uses assumed background dissolved oxygen levels and stream temperatures in addition to the design flow of the facility and the 7-Q10 of the receiving water.

Total suspended solids (TSS) – Due to the receiving water use designation change TSS limits were re-evaluated. TSS limits are regulated by NR 102.04(1), Wis. Adm. Code and are included whenever BOD5 limits are needed and are set equal to the BOD5 limits but no lower than 10 mg/L.

pH - Categorical limits for pH are required per ch. NR 210 (Subchapter II).

Dissolved Oxygen (DO) - The DO limits in this permit are based on water quality standards from surface waters classified as fish and aquatic life as specified in s. NR 102.04(4)(a) and (b), Wis. Adm. Code.

Ammonia – *Daily* - Due to the change in receiving water designation, ammonia limits were re-evaluated. Using current acute and chronic ammonia toxicity criteria found in Tables 2C and 4B of NR 105 Wis. Adm. Code and limit calculating procedures (Subchapter IV of 106, Wis. Adm. Code ammonia limitations were calculated for the facility. Based on a reasonable potential analysis it was found ammonia limits are needed to ensure toxic conditions in the receiving water do not occur. Daily maximum limits expressed as a single limit or as a variable limit based on effluent pH were calculated. Expression as a variable limit shall continue. Sample results for pH shall be used to calculate the daily variable limit. Total ammonia (NH3-N) sampling shall occur on the same day pH levels are monitored. The applicable variable limit shall be recorded on the Electronic Discharge Monitoring Report (eDMR) in the Ammonia Variable Limit column. Report the effluent ammonia sample result in the 'Nitrogen, Ammonia (NH3-N) Total' column. Compare the variable daily maximum ammonia limit to the reported ammonia result, record the number of exceedances in the box to the right of the 'Limit in Effect' 'Daily Max' row in the 'Summary' tables at the end of the eDMR.

Daily Maximum Ammonia Nitrogen Limits based on effluent pH

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq pH \leq 6.1$	60	$7.0 < pH \leq 7.1$	36	$8.0 < pH \leq 8.1$	7.6
$6.1 < pH \leq 6.2$	59	$7.1 < pH \leq 7.2$	32	$8.1 < pH \leq 8.2$	6.3
$6.2 < pH \leq 6.3$	57	$7.2 < pH \leq 7.3$	29	$8.2 < pH \leq 8.3$	5.2
$6.3 < pH \leq 6.4$	56	$7.3 < pH \leq 7.4$	25	$8.3 < pH \leq 8.4$	4.3
$6.4 < pH \leq 6.5$	54	$7.4 < pH \leq 7.5$	22	$8.4 < pH \leq 8.5$	3.5

6.5 < pH ≤ 6.6	52	7.5 < pH ≤ 7.6	19	8.5 < pH ≤ 8.6	2.9
6.6 < pH ≤ 6.7	49	7.6 < pH ≤ 7.7	16	8.6 < pH ≤ 8.7	2.4
6.7 < pH ≤ 6.8	46	7.7 < pH ≤ 7.8	13	8.7 < pH ≤ 8.8	2.0
6.8 < pH ≤ 6.9	43	7.8 < pH ≤ 7.9	11	8.8 < pH ≤ 8.9	1.7
6.9 < pH ≤ 7.0	40	7.9 < pH ≤ 8.0	9.2	8.9 < pH ≤ 9.0	1.5

Ammonia – *Weekly and Monthly* - Calculated seasonal weekly average and monthly average limits were considered. There is reasonable potential for both weekly and monthly average limits to be exceeded and thus have been included this permit term.

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

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

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

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

In the case of Village of Clayton:

- A TBEL of 1.0 mg/L is needed if a facility discharges more than the threshold of 150 pounds per month (s. NR 217.04(1)(a)1 Wis. Adm. Code). The limit memo determined that the facility discharges less than the threshold; therefore, a TBEL is not applicable this permit term.
- Based on the size and classification of the stream, the categorical water quality criterion for the Clayton Branch is 75 ug/L. This criterion and instream background phosphorus data are used to calculate the stream criteria-based WQBELs. The calculated WQBELs are 0.23 mg/L (monthly average), 0.075 mg/L (6-month average). The facility is unable to meet the final WQBEL limits, for this permit term. The permittee has consequently applied for a Multi-Discharger Variance (MDV) for phosphorus as provided for in s. 283.16, Wis. Stats., and as 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. *As a result, the interim effluent limit for total phosphorus is 1.4 mg/L as an average monthly limit, with an interim MDV limit of 1.0 mg/L as an average monthly limit effective at the end of the Phosphorus Multi-Discharger Variance Interim Limit (1.0 mg/L) Schedule*.

  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 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.

- The facility lies within the boundaries of the Lake St. Croix total maximum daily load (TMDL) area. The TMDL was developed to address phosphorus water quality impairments. The Lake St. Croix TMDL for total phosphorus was approved by the U.S. Environmental Protection Agency on. August 8, 2012. More information about the TMDL can be found at https://dnr.wisconsin.gov/topic/TMDLs/TMDLReports.html . The Village of Clayton is also included in a group of 12 (in Wisconsin) small, permitted point source dischargers facilities subject to an aggregate wasteload allocation (WLA) of 6932 pounds per year (3151 kg/year) under the Lake St. Croix Total Maximum Daily Load (TMDL) report. Compliance with the wasteload allocation is required upon reissuance. The Village will be considered in compliance with its Lake St. Croix TMDL allocation if the phosphorus discharged from the facility is less than the permittee's individual allocation (528 pounds per year (240 kg/year)) OR the total annual loading from all permittees in the aggregate category is less than the aggregate allocation. For example, if the Village exceeds its individual allocation but the aggregate allocation is not exceeded, the Village is still in compliance with this permit.

  Calculation and reporting of the total mass of phosphorus discharged over the past 12 months is required to track progress in meeting the overall TMDL requirements. The 12-month rolling sum equals the sum of the most recent 12 consecutive months of total monthly discharges. This value should be reported on the eDMR on the last day of each month.

  Calculations needed to determine compliance with the wasteload allocation are:

  - **Total Monthly Discharge (lbs/month)** = monthly average concentration (mg/L) x total flow for the month (MG/month) x 8.34.
  - **12-Month Rolling Sum of Total Monthly Discharge (lbs/year)** = the sum of the most recent 12 consecutive months of total monthly discharges. This value should be reported on the eDMR on the last day of each month.

Temperature - Requirements for Temperature are included in NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. Thermal discharges must meet the Public Health criterion of 120 degrees F and the Fish & Aquatic Life criteria which are established to protect aquatic communities from lethal and sub-lethal thermal effects. Using the administrative rules for thermal discharges effluent thermal limits were calculated. The calculated thermal limits for Clayton Branch indicate variable daily maximum and weekly average temperature limits. At temperatures above approximately 103° F, conventional biological treatment systems do not function properly and experience upsets. There is no indication that this temperature has ever been experienced in this treatment system. Therefore, there is no reasonable potential for the discharge to exceed this limit. No monitoring or effluent limits are recommended for temperature this permit term. Monitoring one year in 2026 is required in preparation for the next permit issuance.

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. Annual tests are scheduled in the following rotating quarters:

- July – September 2025
- October – December 2026
- January – March 2027
- April – June 2028
- July – September 2029

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

Sample Frequency - The "**Monitoring Frequencies for Individual Wastewater Permits**" guidance document (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 fairness and consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. Previously permitted monitoring frequencies for BOD5, total suspended solids, pH, and dissolved oxygen fall below the standard monitoring frequency outlined in guidance. Since data submitted during the previous permit term shows consistent compliance with permit limitations, and the set monitoring frequency is consistent with requirements of state code, the reduced monitoring frequency is continued in the proposed permit. If performance levels begin to vary during the permitted term, the department may re-evaluate current sampling frequencies and implement more frequent monitoring via permit modification or at permit reissuance.

3 Land Application - Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
003	B	Liquid	Sludge removal is not anticipated this permit term. If removal is needed see the land application and schedule sections of the permit for more information.			
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No, during the most recent set of samples (Aug 2020) the highest data result was 1.04 pCi/liter.						
Is a priority pollutant scan required? No						

Sample Point Number: 003- LAGOON SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Once	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Once	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Once	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Once	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Copper Dry Wt	Ceiling	4,300 mg/kg	Once	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Once	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Once	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Once	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Once	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Once	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Once	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Once	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Once	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Once	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Once	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Once	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Once	Composite	
Nitrogen, Total Kjeldahl		Percent	Per Application	Composite	
Nitrogen, Ammonia (NH3-N) Total		Percent	Per Application	Composite	
Phosphorus, Total		Percent	Per Application	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Application	Composite	
Potassium, Total Recoverable		Percent	Per Application	Composite	
PFOA + PFOS		ug/kg	Once	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Once	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

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

- List 1 (Metals) monitoring is required during the second year of the permit term (2026).
- It is recommended that List 2 (Nutrients) monitoring occur with the List 1 monitoring.
- PFAS monitoring is required during the second year of the permit term (2026).
- Due to changes within the land application forms, the 3400-049 ("Characteristics Report"), 3400-052 ("Other Methods of Disposal") and 3400-055 (Annual Land Application") forms will need to be submitted each year.

Explanation of Limits and Monitoring Requirements

Requirements for 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. Radium requirements are addressed in s. NR 204.07(3)(n).)

List 2 Nutrient monitoring – Monitoring for list 2 (nutrients) is highly recommended at the same time as the monitoring of List 1 (metals) in year 2 of the permit (2025). Results will assist in the determination of the acres needed for land application of sludge should it be necessary. The number of acres needed is also required for the Sludge Management Schedule (see schedules for more information).

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

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

Sludge analysis during the second year of the permit term has been included. There are check boxes available on the electronic forms to identify if desludging didn't occur.

- Sludge characteristics report (3400-049) – at the top of the form check "yes" or "no" in the box identifying if any land application occurred that year. Complete the form if required or identify the year samples will be or have been taken in the comments section.
- 3400-052 ("Other Methods of Disposal") and 3400-055 ("Annual Land Application") - The reports are technically 2 separate forms that are now combined in one location but separated onto two different tabs. If you answer "No" to both listed questions the forms are complete. If you need to answer "Yes" to either question the corresponding form tabs will go from gray to blue indicting information can be entered on the report.

4 Schedules

4.1 Disinfection and Effluent Limitations for E. coli

Required Action	Due Date
Status Update: The permittee shall submit information within the January 2025 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.	02/21/2025
Report on Effluent Discharge: The permittee shall prepare and submit a report on effluent discharge. The report shall include an evaluation of collected effluent data and the facility's ability to comply with final E. coli limitations. The report shall state whether current treatment results in compliance with the final E. coli limitations. The permittee shall also submit a request to the department to evaluate the need for disinfection pursuant s. NR 210.06(3), Wis. Adm. Code. MODIFICATION - If the department determines, based on the information submitted in the Report on Effluent Discharges, that disinfection is not required pursuant s. NR 210.06(3), Wis. Adm. Code, the department will modify or revoke and reissue the permit in accordance with public notice procedures under ch. 283, Wis. Stats., and ch. NR 203, Wis. Adm. Code, to remove monitoring, the final E. coli limitation, and the remaining actions in this schedule of compliance. FACILITY PLAN - If the Report on Effluent Discharge concludes that current treatment does not results in compliance with the final E. coli limitations, the permittee shall initiate development of a facility plan for meeting final E. coli limitations and comply with the remaining required actions in this schedule of compliance.	11/30/2025
Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	04/30/2026
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 meet disinfection requirements per s. NR 210.06(1), Wis. Adm Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below.	03/31/2027
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

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

This compliance schedule requires the permittee to achieve compliance with the specified MDV interim effluent limit in accordance with s. 283.16(6), Wis. Stats., by the due date.

Required Action	Due Date
Report on Effluent Discharges: Submit a report on effluent discharges of phosphorus with conclusions regarding compliance.	06/30/2025
Action Plan: Submit an action plan for complying with the specified interim effluent limit. If construction is required, include plans and specifications with the submittal.	12/31/2025
Initiate Actions: Initiate actions identified in the plan.	06/30/2026
Complete Actions: Complete actions identified in the plan and achieve compliance with the specified interim effluent limit.	12/31/2026

4.3 Phosphorus Schedule - Continued Optimization

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

Required Action	Due Date
Optimization: The permittee shall continue to implement the optimization plan as previously approved to optimize performance to control phosphorus discharges. Submit a progress report on optimizing removal of phosphorus by the Due Date.	12/31/2025
Progress Report #2: Submit a progress report on optimizing removal of phosphorus.	12/31/2026
Progress Report #3: Submit a progress report on optimizing removal of phosphorus.	12/31/2027
Progress Report #4: Submit a progress report on optimizing removal of phosphorus.	12/31/2028
Progress Report #5: Submit a progress report on optimizing removal of phosphorus.	12/31/2029

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 ($64.75] 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	03/31/2027

amount remitted to the participating counties.	
Annual Verification of Payment #3: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/31/2028
Annual Verification of Payment #4: Submit Form 3200-151 to the Department indicating total amount remitted to the participating counties.	03/31/2029
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.	

4.5 Sludge Management Plan

Required Action	Due Date
Submit a Sludge Management Plan: The permittee shall submit a management plan for approval if removal of sludge will occur during this permit term. The plan shall demonstrate compliance with ch. NR 204 Wis. Adm. Code and at minimum address 1) How and where is sludge sampled; 2) Available sludge storage details and location(s); 3)How will the sludge be removed with details on volume, characterization and how will the treatment plant continue to function during the drawdown; 4) Describe the type of transportation and spreading vehicles and loading and unloading practices; 5) Identify approved land application sites, apply for needed sites, site limitations, total acres needed and vegetative cover management; 6) Specify record keeping procedures including site loading; 7) Address contingency plans for adverse weather and odor/nuisance abatement; and 8) Include any other pertinent information such as other disposal options that may be used or specifications of any pretreatment processes Once approved, all sludge management activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes. No desludging may occur unless approval from the Department is obtained. Daily logs shall be kept that record where the sludge has been disposed. The plan is due at least 60 days prior to desludging.	

Explanation of Schedules

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

Phosphorus Multi-Discharger Variance Interim Limit (1.4 mg/L) - Subsection 283.16(6), Wis. Stats., establishes required interim phosphorus effluent limits that must be met for multi-discharger variance (MDV) eligibility. The schedule above provides the permittee with two years to comply with that limit.

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

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

non-point sources of phosphorus within the HUC 8 watershed in which the permittee is located. The permittee has selected the "Payment to Counties" watershed option described in s. 283.16(8), Wis. Stats. Under this option the permittee shall make annual payment(s) to participating county(s) that are calculated based on the amount of phosphorus actually discharged during a calendar year in pounds per year less the amount of phosphorus that would have been discharged had the permittee discharged phosphorus at a target value concentration of 0.2 mg/L. The pounds of phosphorus discharged in excess of the target value is multiplied by a per pound phosphorus charge that will equal $____ 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).

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

Attachments:

Water Flow Schematic created April 2018

"Village of Clayton, Clayton Branch (WBIC 2625100) to South Branch Beaver Brook (WBIC 2624400), Polk County" memo dated April 25, 2024

"Water Quality-Based Effluent Limitations for the Village of Clayton (WI-0036706)" memo dated June 6, 2024

MDV Conditional Approval

MDV Evaluation Checklist

Expiration Date:

December 31, 2029

Justification Of Any Waivers From Permit Application Requirements

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

1. The low design flow (0.087 MGD) identified during the application process. The design flow has been rerated as part of the reissuance process to 0.105 MGD. The waiver will not be extended into the next application process.
2. The wastewater is all domestic with no industrial contributors to the collection system.
3. The metals in the sludge are well below high quality sludge limits which correlates to low metal concentrations in the effluent.
4. Based on the total points accumulated on the WET checklist and Chapter 1.3 of the WET Guidance Document there is little likelihood the effluent is toxic.

Prepared By: Sheri A. Snowbank Wastewater Specialist

Date: September 17, 2024

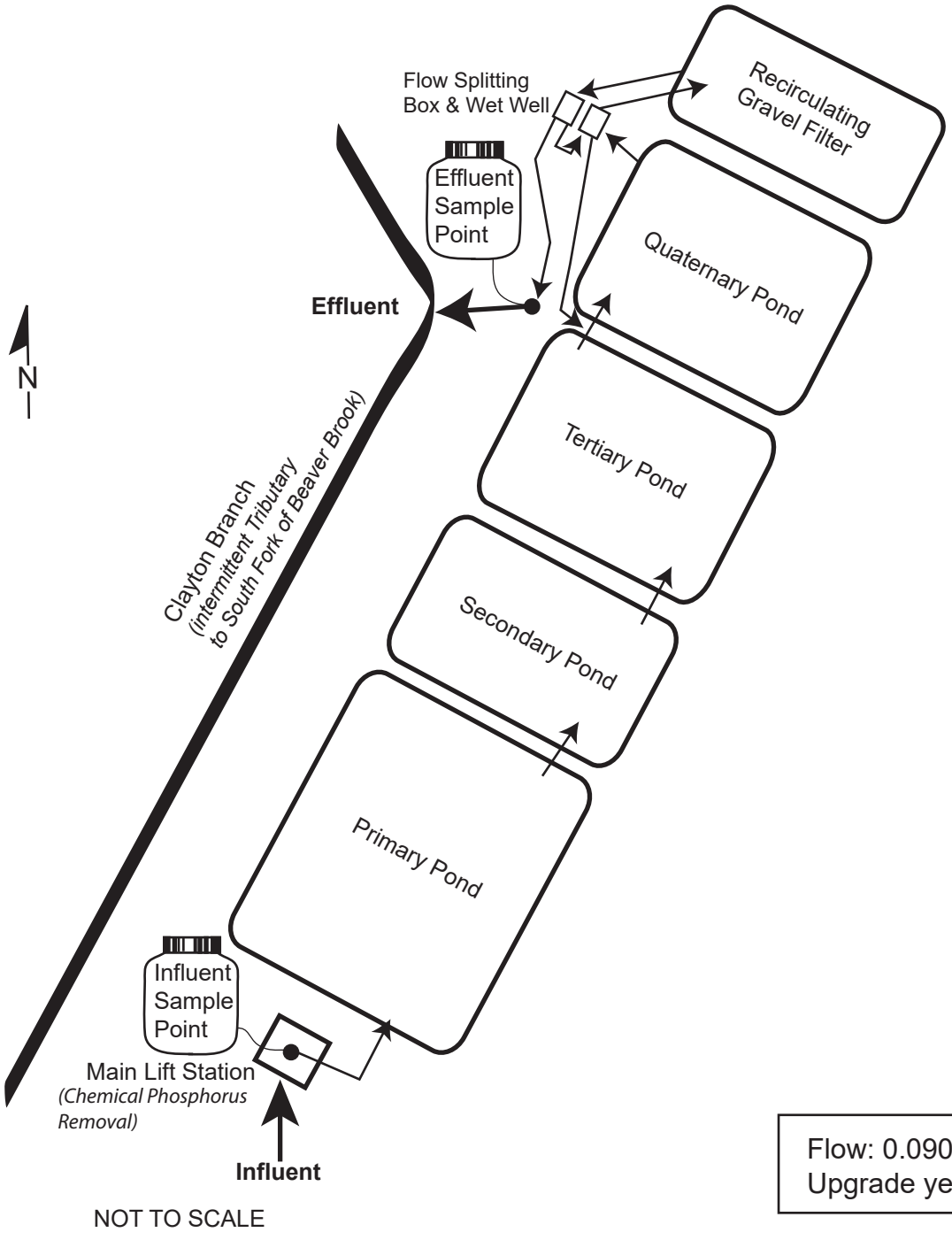
Date updated based on Factcheck comments:

Date updated based on public notice comments:

Notice of reissuance was published in the Amery Free Press, PO Box 424, Amery, WI 54001-0424.

Village of Clayton
Wastewater Treatment Plant

The Clayton wastewater treatment facility consists of four stabilization ponds operated in series and a recirculating gravel filter. Effluent can be discharged under fill and draw limits in March, April, May, September, October, and November and under continuous discharge limits in January, February, June, July, August, and December. The diagram below shows the treatment units and sampling locations.



Flow: 0.0909 MGD
Upgrade year: 2017

DATE: 4-25-2024 FILE REF: NA

TO: Mike Polkinghorn, Limit Calculator; Carson Johnson, Compliance Engineer

FROM: Madeline Roberts, Stream Biologist; Kristi Minahan, Water Quality Standards; Diane Figiel, Limit Calculator Coordinator

SUBJECT: Village of Clayton, Clayton Branch (WBIC 2625100) to South Branch Beaver Brook (WBIC 2624400), Polk County

Overview of issue

In preparation for reissuance of the Village of Clayton permit, staff were requested to do a site visit to determine the appropriate stream classifications for the receiving waters. Clayton has an option to continuously discharge from Dec-Feb and June-Aug with annual average design flow of 0.0909 MGD, but they sometimes do not discharge during these time frames. They have noncontinuous discharge in the other months, with a permitted daily maximum flow of 0.17 MGD for March, 0.26 MGD for April and Sept.-Nov., and 0.07 MGD for May (0.26 , 0.40, and 0.11 cfs respectively).

At some time between 1976 and 1978, the outfall was moved from a location next to the treatment ponds to their current outfall location ~2,500 ft west of the facility, via a pipe. This is documented in historical memos from 1976 (Moe & Teske) and 1978 (Oehmcke). The current outfall is located west of US HWY 63 just north of Clayton Br. with a very short flow path (about 50 ft.) to Clayton Br.

The facility's previous permit limits were based on LAL for 0.1 mile from the outfall, though this appears to be a misinterpretation of the location of the LAL in code (which was based on the old outfall location). The downstream portion of Clayton Branch and the South Branch Beaver Brook has been treated as warmwater, and downstream protection limits for phosphorus for these segments are included in the permit.

Water resources staff visited the site on Sept. 11, 2023. The objective of the site visit was to determine the appropriate stream classifications for Clayton Branch at the point of discharge and downstream. Staff were unable to do a fish survey in Clayton Branch on that date due to limited flow and extensive reed canary grass in the stream and lack of permission at downstream crossings. However, a previous fish survey was available from 2002 for Clayton Branch. A fish survey farther downstream on South Branch of Beaver Brook was conducted on August 8, 2023.

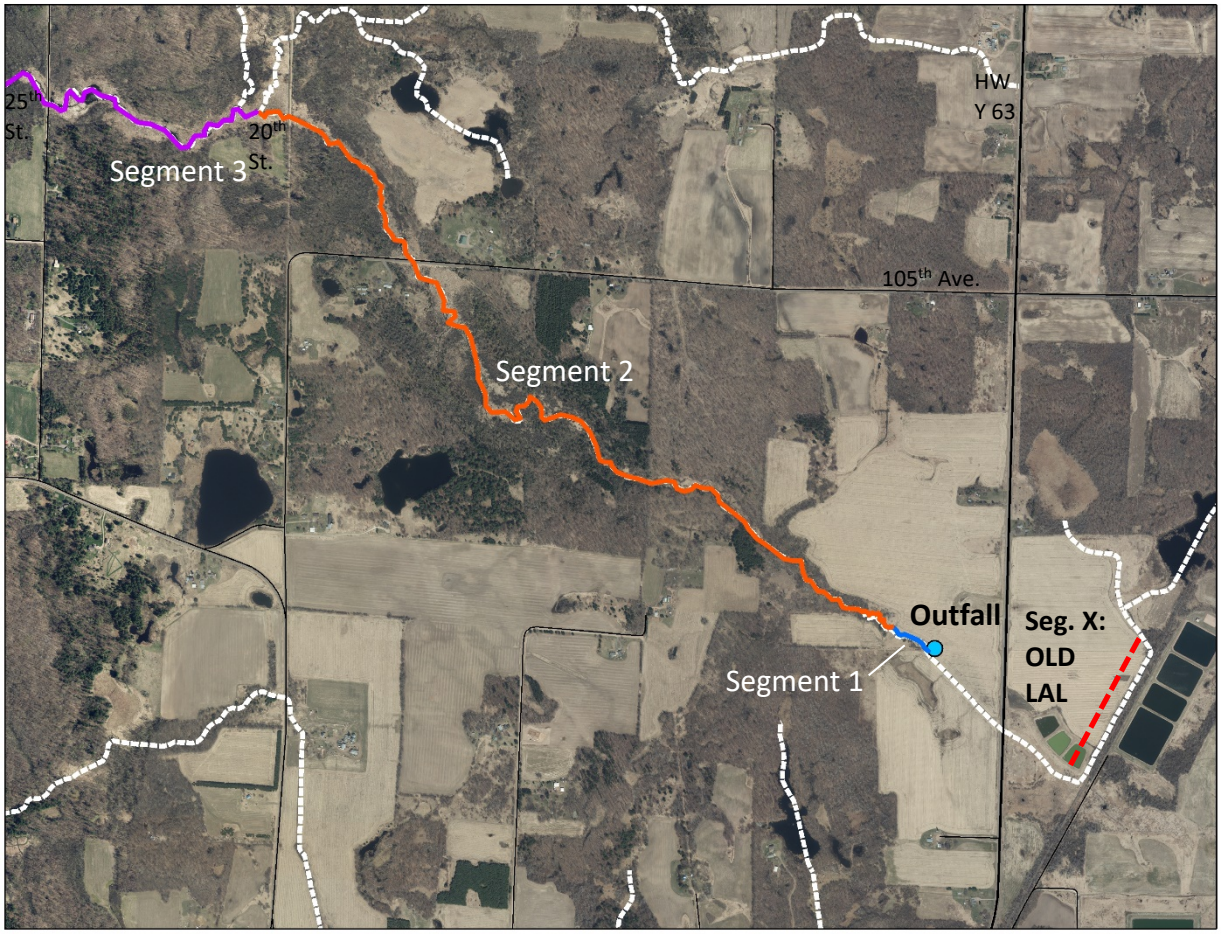
Summary of recommendations

- **Segment X: OLD LAL (no longer relevant to facility's discharge path): Clayton Branch (WBIC 2625100, aka "unnamed tributary to the S. Br. Beaver Brook") from outfall to old railroad crossing (~0.1 mi)**
  - *Codified designated use:* There was a short stretch immediately downstream of the 1976 outfall location near the treatment ponds, east of an old railroad crossing that was initially listed in the 1970s (and is still listed) in ch. NR 104 as Limited Aquatic Life (LAL, part of WBIC 2625100). The general location is shown on Map 1 and the exact location of this segment is documented in the 1976 memo/map. In 1978 and in 2003 it was recommended that this LAL listing be removed because the outfall was no longer located there. NR 104 lists this as LAL-Diffuse surface water for the following extent: "Drainage − Tributary − South Branch Beaver Brook (Clayton) – Drainage area east of railroad tracks in W1/2, SE1/4, NE1/4, Sec. 13, T33N, R15W". The railroad tracks were converted to the Cattail State Trail (see Map 1 for old track location), but the extent of this segment is shown on the map based on the PLSS in code.
  - *Classification used for previous permit issuance:* LAL for ~0.1 mile
  - *Previous stream class recommendations:* The 2003 recommendations proposed removing this LAL portion and replacing it with an LFF farther downstream (see Seg. 1).
  - *Modeled Natural Community:* Cool-Cold Headwater

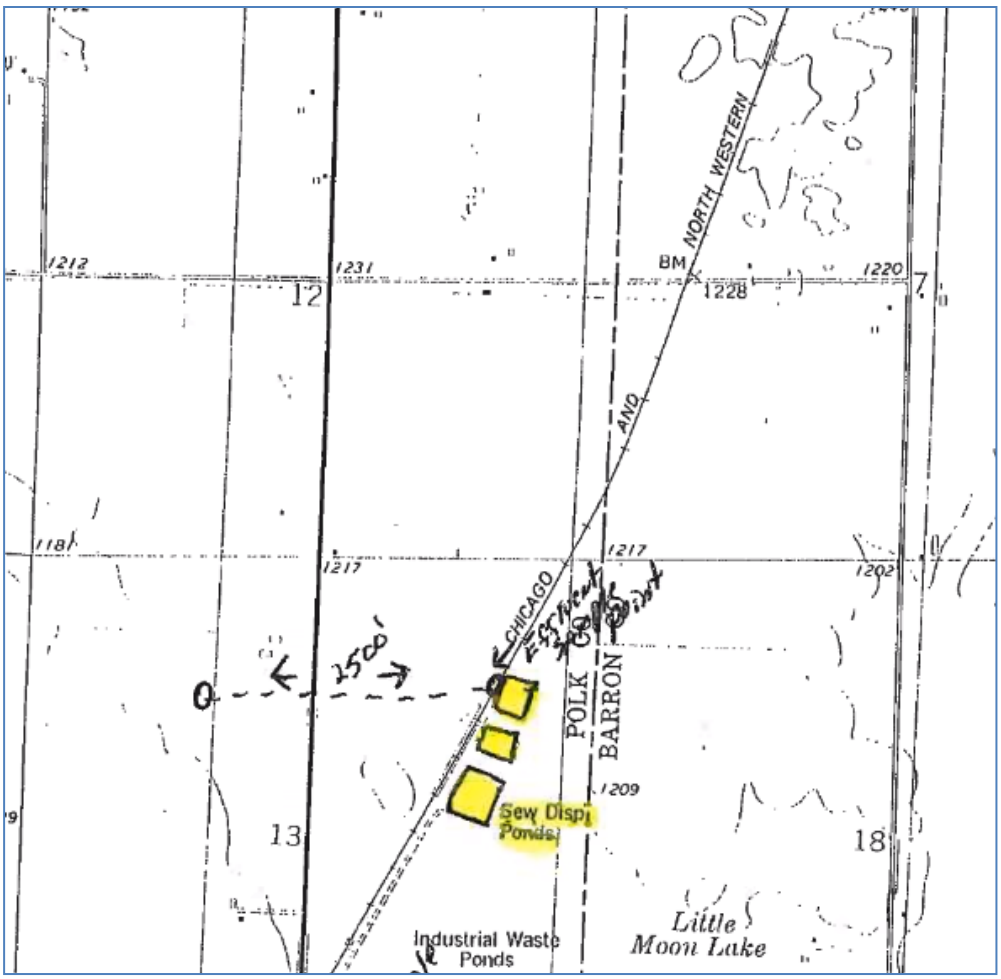
- *New recommended Natural Community and Designated Use:* Not evaluated since the discharge location is farther downstream. Recommend removing LAL from code.

- **Segment 1: Clayton Branch from current outfall to ~0.1 mi downstream at private crossing**
  - *Codified designated use:* Not listed in NR 104 as LAL or LFF, so defaults to full fish and aquatic life-Warmwater
  - *Classification used for previous permit issuance:* Facility's limits have been based on 0.1 mile LAL and Warmwater after that. However, this appears to be a misinterpretation of the LAL segment, which does not apply to Seg. 1.
  - *Previous stream class recommendations:*
    - At one point, the 2003 recommendations proposed "LFF from the WWTP outfall in the NWQ T33N R15W S13 for 1.5 miles to the east-west town road in T33N R15W S11" (which we interpret to mean 105th Ave in S11)".
    - However, the historic file records indicate an email exchange on May 21, 2003 between Laura Bub and Jim Cahow, indicating that the overall recommendation was that Clayton Branch be removed from the code altogether (no longer LAL or LFF). This was proposed to be done in "Phase II" of the code revisions (the above recommendation was for an interim revision for Phase I). Jim Cahow, Stream Biologist, had conducted field surveys in 2002 which concluded that all of Clayton Branch should be considered full fish and aquatic life. A portion from Hwy 63 down one mile was Macroinvertebrate, with the portion from there to S. Br. Beaver Brook recommended as Diverse Fish & Aquatic Life--Non-Gamefish Community Waters (an older classification terminology).
  - *Modeled Natural Community:* Cool-Cold Headwater
- *New recommended Natural Community and Designated Use:* Designated Use is recommended as either LFF or Warmwater. NC Verification not done at this time.
- **Segment 2: Clayton Branch from private crossing to S. Br. Beaver Brook**
  - *Codified designated use:* Not listed in NR 104 as LAL or LFF, so defaults to full fish and aquatic life-Warmwater
  - *Classification used for previous permit issuance:* Warmwater
  - *Previous stream class recommendations:* NA
  - *Modeled Natural Community:* Cool-Cold Headwater
  - *New recommended Natural Community and Designated Use:* Full fish and aquatic life-Warmwater. NC not verified at this time.
- **Segment 3: South Branch Beaver Brook (2624400)**
  - *Codified designated use:* Not in NR 104 as LAL or LFF, so defaults to Warmwater
  - *Classification used for previous permit issuance:* Warmwater
  - *Previous stream class recommendations:* NA
  - *Modeled Natural Community:* Cool-Cold Headwater
  - *New recommended NC & DU:* Full fish and aquatic life-Warmwater. NC not verified at this time due to high number of tolerant species.

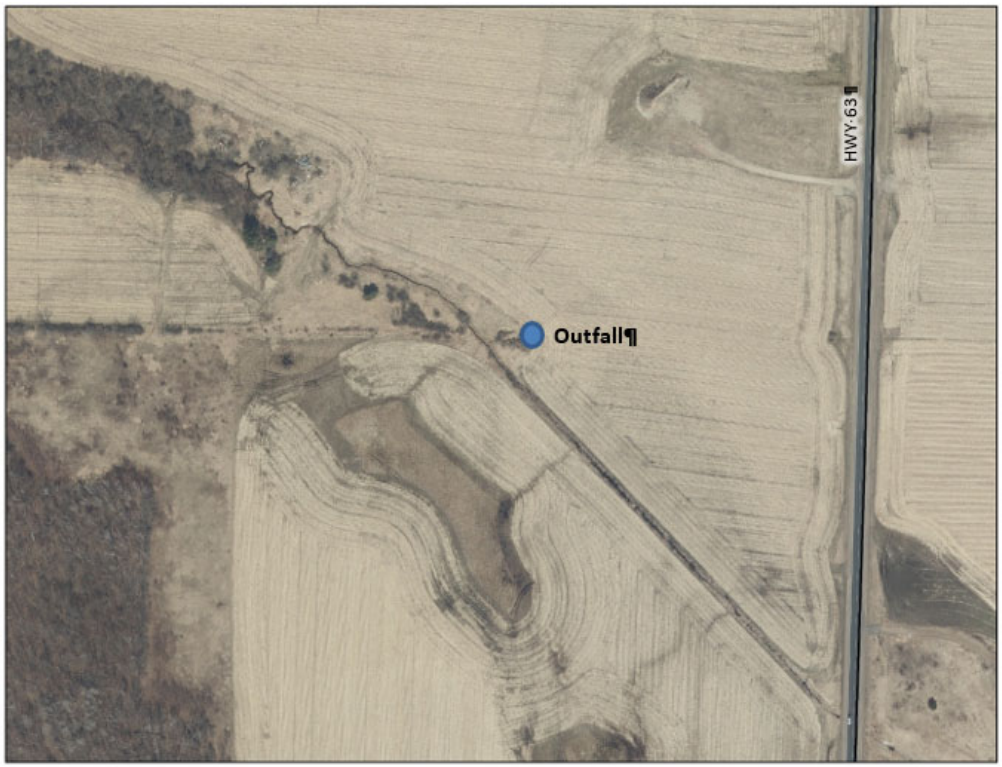
Site overview maps



Map 1. Site map of Clayton WWTP current outfall (blue dot), Clayton Branch (WBIC 2625100, segment 1 & 2), and South Branch of Beaver Brook (Segment 3, WBIC 2624400). Fish survey was done on Segment 3 100m downstream of 25th Street. The 1976 outfall location (yellow triangle) was either proposed but never used or was discontinued by 1978. The LAL segment listed in ch. NR 104 (red dashed line) is shown in relation to the proposed 1976 outfall point.



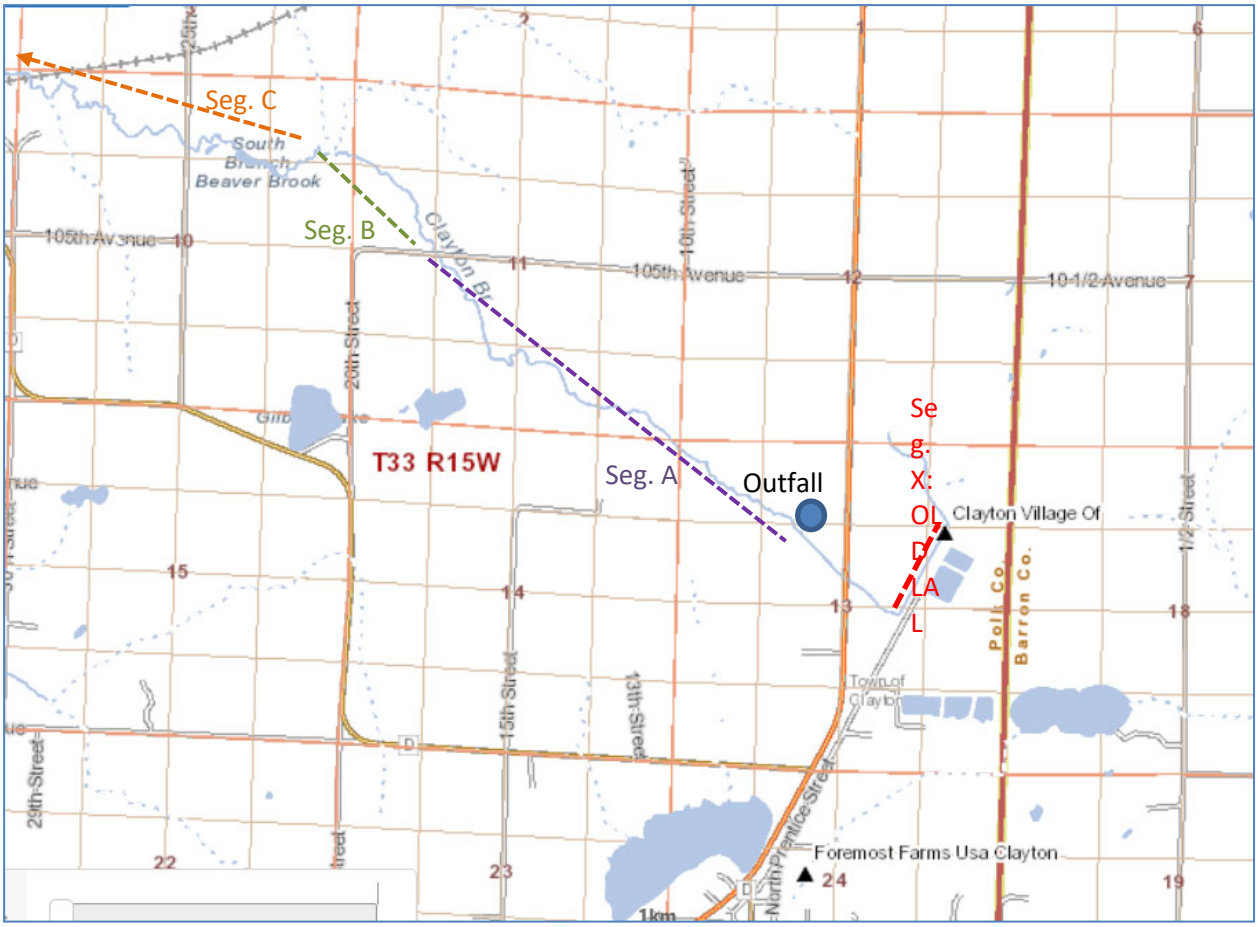
Map 2. Map included in the permit application submitted by facility and received by DNR in 2000, showing what may be a pipe (dashed line) running East to West for 2,500 feet to the outfall at the current location. This map also shows the former railroad line. (Handwriting says "effluent sample point".)



Map 3. Blue dot shows outfall, west of Hwy 63. This location is based on visit with facility operator on September 11, 2023.

Historic Recommendations and Memos

- *1976 memo from Terry Moe and David Teske.* The historic LAL recommendation in ch. NR 104 for a segment of Clayton Branch along the previously existing railroad tracks was based on the 1976 site visit by Terry Moe. At that time, the program expected the outfall to be constructed along that segment near the lagoons and railroad track.
- 1978 memo from A. A. Oehmcke. In 1978 the outfall was recorded in its current location (in the field west of the facility and old track location) during a site visit done by A. A. Oehmcke. Oehmcke recommended that the LAL portion be removed from code, because the outfall was not at that location. It also recommended an LFF segment be added from the current outfall location through the southern half of Section 11. This was then used as the basis for a 2003 recommendation for a code update to remove the LAL portion and add an LFF portion; however, the code was never updated.
- *2002 memo by Jim Cahow.* In this memo, the stream had water present most of the year even up to highway 63 during an above average precipitation year. At that time the stream was experiencing runoff from a manure pit that was overflowing as well as runoff from cheese waste that was landspread upstream of Highway 63. Cahow stated that with improved agricultural practices the stream would likely see an improvement in its biological community. Staff sampled macroinvertebrates ~400m downstream of Highway 63 near the outfall location. Macroinvertebrates found included narrow-winged damselflies, northern case-maker caddisflies, finger-net caddisflies, water boatmen, a predaceous diving beetle, a Helisoma snail, fingernail clams, tubifex worms, leeches, scuds (Hyalella azteca), chironomids, chaoborus, and daphnia magna. A fish survey was also done downstream of 125th Avenue. Due to soft sediment the survey was limited to 20m. Forty-eight total fish and 6 species were captured, including 39 brook stickleback, 3 fathead minnow, 2 northern redbelly dace, 2 brassy minnow, 1 pearl dace, and 1 finescale dace. If a full survey had been possible, it is likely more fish and possibly more species would have been captured. Clayton Branch was recommended to be listed as full aquatic macroinvertebrate life near the outfall and full fish and aquatic life downstream. This recommendation was meant to supersede the Oehmcke recommendation.
- *2003 draft code recommendations table prepared by Laura Bub.* In the 2003 recommendations table, Clayton Branch was presented as several segments. However, a subsequent email (May 21, 2003 between Laura Bub and Jim Cahow) revealed that the 2003 recommendation should have been based on Cahow's more recent 2002 site visit and fish survey, and therefore the entire extent of Clayton Branch should be considered full fish and aquatic life-Warmwater (forage fish/non-gamefish). Historic (lettered) segments illustrating the 2003 recommendation from the Laura Bub table (shown in Map 4) are as follows:
    - Segment X "OLD LAL" was a short stretch immediately downstream of the 1976 outfall location near the treatment ponds, east of an old railroad crossing. This segment is still listed in ch. NR 104 as Limited Aquatic Life (LAL, WBIC 2625100; the general location is shown on Map 1 and the exact location of this segment is documented in the 1976 memo/map). In 2003 it was recommended that this LAL listing be removed.
    - Seg. A is a segment proposed in 2003 to be added as a new Limited Forage Fish (LFF) segment, from the current outfall (blue dot on Maps 1-3) extending 1.5 miles to what we believe is 105th Ave. (same WBIC).
    - Segment B is the remainder of Clayton Branch (same WBIC) down to its confluence with South Branch Beaver Brook (Segment C, WBIC 2624400).
    - **Note again that the 2003 recommendations in the Laura Bub table were determined to be in error based on the email exchange with Jim Cahow, so Map 4 is simply for explanatory purposes of the historic record.



Map 4. Shows the current outfall location (blue dot), old proposed 1976 outfall location (black triangle), with Segment X (OLD LAL) and Segs. A-B. (DNR Water Condition Viewer)

Current Site Observations

Water resources staff visited the site in August and September 2023. The objective of the site visits were to determine the appropriate stream classifications for Clayton Branch at the point of discharge and downstream and determine if a fish survey was possible.

Upstream of Segment 1 the stream was dry at the crossing of HWY 63 on 2 site visits, one in August and one in September. Conditions in the summer of 2023 were dry, with Clayton in a moderate drought. The Village of Clayton was discharging on September 11, 2023 during the site visit. Downstream of Highway 63 the stream was dry and had many wetland plants within the channel. The outfall is a clay drainage tile pipe. The effluent was flowing over broken clay tile pieces and grass (photo 1). The flow path becomes a more defined channel approximately 6 feet long with sand bottom before emptying into Clayton Branch. A short distance upstream of where the outfall joins Clayton Branch, the channel was covered in reed canary grass and sedges with water present ~ 6 inches deep.

- **Segment 1: Clayton Branch from current outfall to ~0.1 mi downstream at private crossing**
  Downstream of the outfall water was present. Dense reed canary grass prevented sampling and inhibited staff's ability to follow the flow.
- **Segment 2: Clayton Branch from private crossing to S. Br. Beaver Brook**
  Water was in the stream channel both upstream and downstream of the 105th Avenue crossing. Upstream of 105th Avenue there is a defined channel leading into a pool that is surrounded by wetland plants. Downstream of 105th Avenue is very similar to the upstream side with a plunge pool and channel that flows through wetlands.

- **Segment 3: South Branch Beaver Brook (2624400)**
  Upstream and downstream of 20th Street the stream has a defined channel with increased stream width that flows through wetlands. Fish were observed downstream of 20th Street. Upstream of 25th Street there is a large pool/ponded area in a wetland complex. Downstream of 25th Street the stream has a large plunge pool that becomes a 3m wide channel through wetlands. Fish were observed on the downstream end by the culvert.

Fish and Habitat Survey Results

Staff conducted a site visit on September 11, 2023 at Clayton Branch. Large stands of reed canary grass in the channel and limited water prevented them from doing a fish survey. Water depth and instream habitat were also difficult to determine with the conditions. Staff did not have permission to access the stream below the outfall or upstream/downstream of 105th Avenue. Since the crossing at 105th Avenue held water all summer during a drought year, it likely holds water year round. Approximately 0.1 miles downstream of the outfall the stream becomes more meandering and appears to hold more water on aerial photos. This could be the transition between an intermittent stream and where the stream holds water more consistently and would support a full fish community.

A 100m fish survey and qualitative habitat survey was done downstream of 25th Avenue on South Branch of Beaver Brook on August 8, 2023. A total of 147 fish were caught from 9 species, including one game fish: northern pike (Table 1). Depth and habitat was good, with many pool areas, bends, and undercut banks (Table 2). A diverse aquatic plant community was present. Overall qualitative habitat score was 65. Thick aquatic vegetation inhibited capture of fish, so more were present than what is reported. Habitat and stream conditions are similar to the crossing at 20th Street. Clayton Branch at 105th Avenue is likely similar in habitat with a smaller channel width.

Fish Survey Data for South Branch of Beaver Brook

Site	Station length (m)	Fish species	Count	Length
downstream of 25th Street	100	Creek chub	23	
		Central mudminnow	82	
		White sucker	12	
		Common shiner	1	
		Hornyhead chub	3	
		Northern pike	1	4.9
		Johnny darter	1	
		Black bullhead	3	
		Western blacknose dace	11	
Total			147	

Table 1. Fish survey data for South Branch of Beaver Brook (WBIC 2624400). Fish survey was conducted on August 8, 2023.

Habitat Survey Results for South Branch of Beaver Brook

Site	Mean Stream Width (m)	Riparian buffer width	Bank erosion	Pool area	Width:depth ratio	Riffle:riffle or bend:bend ratio	Fine sediments	Cover for fish	**Overall score**
Downstream of 25th Street	3	Good (10)	Good (10)	Excellent (10)	Good (10)	Good (10)	Poor (0)	Excellent (15)	65

Table 2. Qualitative Habitat Survey for South Branch of Beaver Brook (WBIC 2624400) conducted on August 8, 2023. Survey was done on the same segment as the fish survey.

Discussion and Designated Use Recommendations

Note: Recommendations from this site visit are shown at the top of this memo.

Overall Clayton Branch transitions from an intermittent stream that likely provides habitat for fish seasonally to a perennial stream with a fish community. Clayton Branch is impacted by the agriculture upstream of the outfall, where it has been channelized and has a limited buffer. The channelization likely limits how long water is held within the stream and reduces available habitat. Agricultural land use can also lead to high peak flows and lower base flows (i.e. flashy hydrology) which may be contributing to the intermittent flows observed. Clayton Branch's lower section has a forested and wetland riparian corridor and more consistent water. South Branch of Beaver Brook below the confluence with Clayton Branch is a perennial stream that flows through wetlands and a fish community.

- **Segment 1: Clayton Branch from current outfall to ~0.1mi downstream at private crossing**
  This segment had water on the day of the site visit. Close to the outfall, the stream likely has flow when the WWTP is discharging, during rain events, and likely seasonally in spring and fall since upstream of the outfall no water was present during the site visit and in August. This is also supported by the 2002 memo. The extent of time when water is present directly below the outfall is unknown. Agricultural land use and channelization likely limit flows and habitat in this segment. Continuous water is likely present downstream of the outfall approximately 0.1 miles where the stream becomes more meandering based on aerial photos. This change in stream characteristics could be the transition between an intermittent stream and where the stream has water more consistently. This location is also close to where the 2002 segment change from "macroinvertebrate full aquatic life" to "full and diverse aquatic life warmwater" was recommended. Because the distance between the intermittent and continuous segments is not very long, it is likely that fish would move up to this segment and upstream of the outfall seasonally when water is present. A good fish community was present in 2002 downstream from this point even through significant agricultural impacts were present. Habitat has likely improved since the 2002 field visit as the manure pit and cattle impacts are no longer present. For these reasons the designated use for segment 1 could appropriately be limited forage fish; however, an LFF designation may require a Use Attainability Analysis (UAA) and Administrative Code revision. If a UAA found that a warmwater use is attainable if controllable conditions were controlled, then a warmwater use would apply.
- **Segment 2: Clayton Branch from private crossing to S. Br. Beaver Brook**
  This segment had water present upstream and downstream of 105th Avenue and where it joins S. Br. Beaver Brook near 20th Street in a dry year. This indicates that this segment is perennial. The habitat is likely similar to S. Br. Beaver Brook downstream of 25th Street. Clayton Branch upstream of 105th Avenue has a smaller width, but it is expected to support a full fish and aquatic life based on available habitat and the fish observed in 2002. Three of the six species observed in 2002 are classified as headwater species, which fits the habitat for this segment. The change in stream characteristics below the private crossing indicate that water is likely present more often than in segment 1. With more water present, it is likely that this segment supports a full fish community. Thus the recommended Designated Use is warm water forage fish community.
- **Segment 3: South Branch Beaver Brook (2624400)**
  A full fish community is present downstream of 25th Street. Water levels and habitat are very similar from 20th Street to downstream of 25th Street. While a natural community verification could not be done, the observed fish community is typical of a cool-warm headwater community. If land use practices improved, the observed fish community could change. South Branch of Beaver Brook's recommended Designated Use is full fish and aquatic life-Warmwater.

Are code changes and/or a Use Attainability Analysis needed?

- The LAL portion should be removed from code as it is no longer relevant to the facility's effluent path; additionally, the location description of the segment is very unclear.
- The designated use for segment 1 could appropriately be limited forage fish; however, an LFF designation may require a Use Attainability Analysis (UAA) and Administrative Code revision. A future fish survey during a spring/early summer timeframe may be useful in verifying the fish community. If a UAA found that a warmwater use is attainable if controllable conditions were controlled, then a warmwater use would apply.
- The modeled natural community for South Branch Beaver Brook is Cool-Cold Headwater, which would be a coldwater designated use category, so verification is needed on the appropriate classification for Segment 3. The classification of S. Br. Beaver Brook would not be likely to affect permit limits so is a lower priority to survey.

Photos taken 8-1-2023, 8-8-2023, & 9-11-2023

Photo 1. Outfall pipe.

Photo 2. Upstream view of flow path from outfall pipe before it joins Clayton Branch.

Photo 3. Clayton Br. above outfall confluence looking upstream.

Photo 4. Clayton Br. Near outfall confluence looking downstream.

Photo 5. Clayton Br looking upstream at 105th Avenue.

Photo 6. Clayton Br looking downstream at 105th Avenue.

Photo 7. Clayton Br.-S. Br. Beaver Brook looking upstream at 20th Street.

Photo 8. S. Branch of Beaver Brook looking downstream at 20th Street.

Photo 9. S. Branch of Beaver Brook looking upstream at 25th Street.

Photo 10. S. Branch of Beaver Brook looking downstream at 25th Street.

Photo 11. S. Branch of Beaver Brook looking upstream at fish survey end.

Photo 12. S. Branch of Beaver Brook looking downstream in fish survey.

Photo 11. S. Branch of Beaver Brook looking downstream

Photo 11. S. Branch of Beaver Brook looking downstream

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: June 6, 2024

TO: Sheri Snowbank – NOR/Spooner Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center

SUBJECT: Water Quality-Based Effluent Limitations for the Village of Clayton
WPDES Permit No. WI-0036706-11-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Village of Clayton in Polk County. This municipal wastewater treatment facility (WWTF) discharges to the Clayton Branch, located in the Beaver Brook Watershed in the St. Croix River Basin. This discharge is included in the Lake St. Croix Basin Total Maximum Daily Load report as approved by EPA on 08/08/2012. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 004:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD_5 May – October November – April June – August December – February	 30 mg/L 30 mg/L		 5.0 mg/L 10 mg/L			2
TSS Year round June – August December – February	 30 mg/L 30 mg/L		10 mg/L			2
pH	9.0 s.u.	6.0 s.u.				2
Dissolved Oxygen		7.0 mg/L				2
E. coli May – September				126 #/100 mL geometric mean		3
Ammonia Nitrogen May – October November – April	 Variable Variable		 8.3 mg/L 16 mg/L	 3.8 mg/L 6.7 mg/L		2, 4
Phosphorus						5
Variance	2.4 mg/L			2.0 mg/L		
Final				0.23 mg/L	0.075 mg/L	
TKN, Nitrate+Nitrite, and Total Nitrogen						6
Temperature						7
Acute WET						8, 10
Chronic WET						9, 10

Footnotes:

1. Monitoring whenever the discharge occurs.

2. These limits are based on the downstream protection of the Warm Water Sport Fish (WWSF) community of Clayton Branch.
3. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL. The permit will include a compliance schedule to meet these limits.
4. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Daily Maximum Ammonia Nitrogen Limits

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
$6.0 \leq pH \leq 6.1$	60	$7.0 < pH \leq 7.1$	36	$8.0 < pH \leq 8.1$	7.6
$6.1 < pH \leq 6.2$	59	$7.1 < pH \leq 7.2$	32	$8.1 < pH \leq 8.2$	6.3
$6.2 < pH \leq 6.3$	57	$7.2 < pH \leq 7.3$	29	$8.2 < pH \leq 8.3$	5.2
$6.3 < pH \leq 6.4$	56	$7.3 < pH \leq 7.4$	25	$8.3 < pH \leq 8.4$	4.3
$6.4 < pH \leq 6.5$	54	$7.4 < pH \leq 7.5$	22	$8.4 < pH \leq 8.5$	3.5
$6.5 < pH \leq 6.6$	52	$7.5 < pH \leq 7.6$	19	$8.5 < pH \leq 8.6$	2.9
$6.6 < pH \leq 6.7$	49	$7.6 < pH \leq 7.7$	16	$8.6 < pH \leq 8.7$	2.4
$6.7 < pH \leq 6.8$	46	$7.7 < pH \leq 7.8$	13	$8.7 < pH \leq 8.8$	2.0
$6.8 < pH \leq 6.9$	43	$7.8 < pH \leq 7.9$	11	$8.8 < pH \leq 8.9$	1.7
$6.9 < pH \leq 7.0$	40	$7.9 < pH \leq 8.0$	9.2	$8.9 < pH \leq 9.0$	1.5

5. If the phosphorus variance application that was submitted is approved by EPA, the variance interim limits may be extended beyond the end of the compliance schedule along with a requirement for total phosphorus pollutant minimization program. A minimum of monthly phosphorus monitoring is recommended to calculate and report monthly phosphorus loads and 12-month rolling sums of monthly phosphorus loads.
6. 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).
7. Monthly temperature monitoring for 1 year is recommended during the reissued permit term to have updated temperature data to determine the need for temperature limits at the next permit issuance.
8. Three acute whole effluent toxicity (WET) tests are recommended during the reissued permit term. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests. If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then acute WET testing is not recommended in the reissued permit.
9. Annual chronic WET tests are recommended during the reissued permit term. The Instream Waste Concentration (IWC) to assess chronic test results is 97%. 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 004 shall be a grab sample collected from Clayton Branch upstream of the confluence with Outfall 004. If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then WET testing can be reduced to 3x chronic tests in the reissued permit.

10. 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).

Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are not required due to the non-continuous nature of the discharge.

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

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

PREPARED BY: Michael A. Polkinghorn – Water Resources Engineer

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

Attachment #1

Water Quality-Based Effluent Limitations for
Village of Clayton

WPDES Permit No. WI-0036706-11-0

Prepared by: Michael A. Polkinghorn

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Clayton wastewater treatment facility serves a population of approximately 838 with no significant industrial contributors. Treatment consists of an influent fine screen, chemical-feed phosphorus reduction system, four stabilization ponds and a recirculating gravel filter. Influent enters the main lift station through the fine screen. The chemical-feed is added prior to the primary treatment pond and gravity transferred to the secondary, tertiary and quaternary ponds. Within the primary and secondary ponds naturally occurring bacteria and organisms already present in the wastewater break down the organic matter. Bacteria and organisms also work on remaining organic matter in the tertiary and quaternary ponds, but their main purpose is holding water during the months when nitrification is inhibited by cold weather. Following the quaternary pond is the recirculating gravel filter. Water is distributed over three beds constructed of layers of gravel and sand and lined with a synthetic liner. Wastewater receives further treatment by the biofilm attached to the gravel extending the period nitrification can occur and increasing total suspended solid removal. The water from the filters is sent back to the splitter tank and filtered until treatment goals are met. Effluent is discharged on a noncontinuous basis via Outfall 004 to Clayton Branch, approx. 2,500 ft of discharge pipe west of the quaternary pond.

The Village of Clayton primarily operates the facility as a noncontinuous discharge during March – December. Therefore, this evaluation will assume a noncontinuous discharge operation will continue into the reissued permit term for any limits or monitoring recommendations.

Attachment #2 is a discharge area map of Outfall 004.

Existing Permit Limitations

The current permit, expiring on 12/31/2023, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					
March	0.17 MGD				
April	0.26 MGD				1
May	0.07 MGD				
September – November	0.26 MGD				
BOD_5					
March – May			45 mg/L	30 mg/L	1
June – August	30 mg/L			15 mg/L	

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
September – November			45 mg/L	30 mg/L	
December – February	30 mg/L			15 mg/L	
TSS					
March – May			45 mg/L	30 mg/L	
June – August	30 mg/L			20 mg/L	1
September – November			45 mg/L	30 mg/L	
December – February	30 mg/L			20 mg/L	
pH	9.0 s.u.	6.0 s.u.			1
Dissolved Oxygen		4.0 mg/L			1
Ammonia Nitrogen					
May – October	Variable		9.8 mg/L	5.3 mg/L	2
November – April	Variable		19 mg/L	8.5 mg/L	
Phosphorus					
Interim				2.98 mg/L	3
Variance				2.0 mg/L	
Temperature					4

Footnotes:

1. These are variance limits (March – May, September – November) as described in s. NR 104.02(4)(c), Wis. Adm. Code, applicable to fill and draw or domestic waste stabilization pond facilities discharging to a Limited Aquatic Life (LAL) or Limited Forage Fish (LFF) community receiving water. In absence of this variance, limits based on the LAL or LFF community of the receiving water as described in s. NR 104.02(3)(a) or (b), Wis. Adm. Code, shall apply.
2. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Daily Maximum Ammonia Nitrogen Limits

Effluent pH	Daily Limit	Effluent pH	Daily Limit	Effluent pH	Daily Limit
$pH \leq 7.7$	>37 mg/L	$8.1 < pH \leq 8.2$	18 mg/L	$8.6 < pH \leq 8.7$	6.8 mg/L
$7.7 < pH \leq 7.8$	37 mg/L	$8.2 < pH \leq 8.3$	15 mg/L	$8.7 < pH \leq 8.8$	5.7 mg/L
$7.8 < pH \leq 7.9$	31 mg/L	$8.3 < pH \leq 8.4$	12 mg/L	$8.8 < pH \leq 8.9$	4.8 mg/L
$7.9 < pH \leq 8.0$	26 mg/L	$8.4 < pH \leq 8.5$	9.9 mg/L	$8.9 < pH \leq 9.0$	4.1 mg/L
$8.0 < pH \leq 8.1$	*21 mg/L	$8.5 < pH \leq 8.6$	8.2 mg/L		

3. This permit contains a variance to the water quality-based effluent limit (WQBEL) for phosphorus granted in accordance with s. 283.15, Wis. Stats. As conditions of this variance, the permittee shall (a) maintain effluent quality at or below the interim effluent limitations specified in the table above per the schedule compliance date, (b) report on reductions and optimizing control of phosphorus, and (c) perform the actions listed in the schedule section of the permit. The variance limit became effective in the current permit on 01/01/2021.
4. Monitoring only.

Receiving Water Information

- Name: Clayton Branch
- Waterbody Identification Code (WBIC): 2625100

- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code:
  - Segment 1: Limited Forage Fish (LFF) or Warm Water Sport Fish (WWSF) community, non-public water supply, from Outfall 004 to approx. 0.1 mi downstream at private crossing. This evaluation will treat the classification as a WWSF community due to the biologist recommendation and the short distance to the next WWSF community segment.
  - Segment 2: WWSF community, non-public water supply, from private crossing to South Branch Beaver Brook.
  - Information about the site visit for determining the biological potential of Clayton Branch is discussed in greater detail in the Receiving Water Classification Memorandum (April 2024) and will be available in the permit file for the Village of Clayton.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are estimated from the Surface Water Data Viewer Streams Natural Communities layer approx. 1.6 mi downstream of Outfall 001 where the drainage area = 2.76 mi^2.

  7-Q_{10} = 0.09 cubic feet per second (cfs)

  7-Q_2 = 0.23 cfs

  The drainage area at Outfall 004 is approx. 1.55 mi^2 estimated by the Purdue Watershed Delineation Tool. Therefore, the drainage area ratio between the two locations is approx. 0.56. This ratio and the low flows at the downstream location will be used to estimate the same low flows at the point of discharge. These adjusted low flows are shown below:

  7-Q_{10} = 0.05 cfs

  7-Q_2 = 0.13 cfs
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Multiple dischargers: None.
- Impaired water status: There are no known impairments to Clayton Branch. Approx. 12.5 mi downstream of Outfall 004, the Apple River Flowage is on the Clean Water Act Section 303(d) list for a phosphorus impairment. In addition, Outfall 004 is included in the Lake St. Croix Basin (LSCB) Total Maximum Daily Load (TMDL) area which addresses phosphorus impairments within the TMDL area.

Effluent Information

- Flow rate(s):

  Flow rate limit = 0.26 million gallons per day (MGD)

  Annual average design = 0.105 MGD

  The flowrate limit of 0.26 MGD is used in place of the annual average design flow of 0.105 MGD to account for the seasonal nature of the discharge. The updated design flow is from the permit fact sheet after the 2017 facility upgrades. The previous annual average design flow was 0.087 MGD. For reference, the actual average flow from January 2019 – April 2024 was 0.186 MGD excluding days discharge did not occur. This flow becomes 0.075 MGD including days discharge did not occur.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with no industrial contributors. Water supply from Clayton Waterworks.
- Total phosphorus wasteload allocation (WLA): 240 kg/yr = 528 lbs/year = 8.7 lbs/day (see Table A.4 of the TMDL report document, "*Lake St. Croix Nutrient Total Maximum Daily Load, May 2012,* page 71*"*).
- Additives: Alum for chemical phosphorus treatment.

- Effluent characterization: This facility is categorized as a minor municipality and received instructions in the application notification letter that exempt it from standard monitoring requirements. The permit required temperature monitoring during the current permit term.

The following table presents the average concentrations and loadings at Outfall 004 from January 2019 – April 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

Parameter	Average Measurement*
Flow Rate	0.186 MGD
BOD_5	<2 mg/L
TSS	<2 mg/L
pH field	7.5 s.u.
Dissolved Oxygen	6.28 mg/L
Ammonia Nitrogen	0.3 mg/L
Phosphorus	1.01 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

Mercury – The permit application did not require monitoring for mercury because the Village of Clayton is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3, Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, "there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5), Wis. Adm. Code." A review of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The concentration in the sludge from April 2023 was nondetectable. **Therefore, mercury monitoring is not recommended during the reissued permit term.**

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

Attachment #1

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR CONVENTIONAL POLLUTANTS

The BOD_5 and TSS limits in the current permit are variance limits as described in s. NR 104.02(4)(c), Wis. Adm. Code, applicable to fill and draw or domestic waste stabilization pond facilities discharging to a LAL or LFF community receiving water. The current variance limits are no longer applicable to the Village of Clayton because the receiving water is no longer considered an LFF community. Therefore, conventional pollutant limits will be reevaluated for the protection of the WWSF community of Clayton Branch.

Because the variance is no longer applicable to the Village of Clayton, **the daily maximum flowrate limits are recommended to be removed during the reissued permit term.**

BOD_5 & DO

In establishing BOD_5 limitations, the primary intent is to prevent a lowering of dissolved oxygen levels in the receiving water below water quality standards as specified in ss. NR 102.04(4)(a) and (b), Wis. Adm. Codes. The 26-lb method (13-lb method for cold water community streams) is the most frequently used approach for calculating BOD_5 limits when resources are not available to develop a detailed water quality model. This simplified model was developed in the 1970's by the Wisconsin Committee on Water Pollution on the Fox, Wisconsin, Oconto, and Flambeau Rivers. Further studies throughout the 1970's proved this model to be relatively accurate. The model has since then been used by the Department on many occasions when resources are not available to perform a site-specific model. The "26" value stems from the following equation:

$$\frac{26\ {}^{\text{lbs}}/_{\text{day}}}{{}^{\text{ft}^3}/_{\text{sec}}} * \frac{1\,\text{day}}{86{,}400\,\text{sec}} * \frac{454{,}000\,\text{mg}}{\text{lbs}} * \frac{1\,\text{ft}^3}{28.32\,\text{L}} = 4.8 = 2.4 * 2\ {}^{\text{mg}}/_{\text{L}}$$

The 4.8 mg/L has been calculated by taking 2.4 mg/L which is the number one receives when converting 26 lbs of BOD/day/cfs into mg/L, multiplied by 2.0 which is the change in the DO level for warm water community streams. A typical background DO level for Wisconsin waters is 7 mg/L, so a 2 mg/L decrease is allowed to meet the 5.0 mg/L standard for WWSF community streams. The above relationship is temperature dependent and an appropriate temperature correction factor is applied. The 26-lb method is based on a typical 24°C summer value for warm water streams. Adjustments for temperature are made using the following equation:

$$k_t = k_{24}\left(0.967^{(T-24)}\right)$$

Where k_{24} = 26 lbs of BOD/day/cfs

<u>Calculations based on Full Assimilative Capacity at 7-Q_{10} Conditions:</u>

$$WA\ Limit\ \left(\frac{mg}{L}\right) = 2.4 * (DO_e - DO_{std}) * \frac{7Q_{10} + Q_e * (1-f)}{Q_e} * 0.967^{T-24}$$

Where:

Q_e = effluent flow = 0.26 MGD

DO_{stream} = background dissolved oxygen = 7.0 mg/L

DO_{eff} = 5.0 mg/L
DO_{std} = dissolved oxygen criteria from s. NR 102.04(4), Wis. Adm. Code = 5.0 mg/L
7-Q_{10} = 0.05 cfs
f = 0
DO_o = Initial mixed river DO = $\frac{DO_{eff}*Q_e+DO_{stream}*(7-Q_{10}-Q_e*f)}{Q_e*(1-f)+7-Q_{10}}$ = 5.2 mg/L
T = Receiving water temperatures from s. NR 102.25, Wis. Adm. Code.

The table below shows the calculated weekly average BOD_5 WQBELs during May – October and November – April. Monthly receiving water temperatures are from s. NR 102.25, Wis. Adm. Code, and are averaged over discharge periods:

Calculated Weekly Average BOD_5 WQBELs

Parameter	May – October	November – April
Effluent Flow (MGD)	0.26	0.26
River Flow 7-Q_{10} (cfs)	0.05	0.05
River Temperature (°F)	62	38
River Temperature (°C)	16	3.3
Effluent DO (mg/L)	5.0	5.0
Background DO (mg/L)	7.0	7.0
Mix DO (mg/L)	5.2	5.2
DO Criterion (mg/L)	5.0	5.0
f	0	0
Concentration Limits (mg/L)	0.8	1.2

The calculated limits are more stringent than the minimum limits the Department typically gives to facilities per standing policy. BOD_5 WQBELs given to facilities are no lower than 5.0 mg/L during May – October and 10 mg/L during November – April as weekly averages. Mass limits are not given during any time period minimum BOD_5 limits are implemented. A dissolved oxygen limit of 7.0 mg/L as a daily minimum is also recommended. **Therefore, the weekly average BOD_5 limit of 5.0 mg/L is recommended during May – October. The weekly average BOD_5 limit of 10 mg/L is recommended during November – April. The daily minimum dissolved oxygen limit of 7.0 mg/L is recommended during the reissued permit term.**

The current permit has the monthly average BOD_5 limits of 30 and 15 mg/L during various monthly ranges. The recommended weekly average BOD_5 limits are more stringent than the current monthly average limits where the Village of Clayton would inherently meet limits with larger averaging periods with the same magnitude. **Therefore, the monthly average BOD_5 limits are recommended to be removed during the reissued permit term. The daily maximum BOD_5 limit of 30 mg/L during June – August and December – February is required to continue during the reissued permit term unless the applicable antibacksliding requirements in subch. II of NR 207, Wis. Adm. Code, are met.**

Effluent BOD_5 data during May 2019 – November 2023 ranged between nondetectable at <2 to 6 mg/L. The Village of Clayton has a weekly effluent BOD_5 monitoring frequency in the current permit where each sample is equivalent to a representative weekly average. The maximum BOD_5 samples of 6 mg/L occurred during December 2020 where the applicable BOD_5 limit would be 10 mg/L. **This effluent data**

shows the Village of Clayton can currently meet the updated BOD_5 limits so a compliance schedule is not needed during the reissued permit term.

Total Suspended Solids (TSS)

Total suspended solids (TSS) effluent limits are regulated via narrative standards described in NR 102.04(1), Wis. Adm. Code. TSS effluent limits are included whenever BOD_5 limits are needed and are set equal to the BOD_5 limits but no lower than 10 mg/L consistent with POTWs. **Because BOD_5 limits of 5.0 and 10 mg/L are recommended, a weekly average TSS limit of 10 mg/L is recommended during the reissued permit term year round.**

The current permit has the monthly average TSS limits of 30 and 20 mg/L during various monthly ranges. The recommended weekly average TSS limit is more stringent than the current monthly average limits where the Village of Clayton would inherently meet limits with larger averaging periods with the same magnitude. **Therefore, the monthly average TSS limits are recommended to be removed during the reissued permit term. The daily maximum TSS limit of 30 mg/L during June – August and December – February is required to continue during the reissued permit term unless the applicable antibacksliding requirements in subch. II of NR 207, Wis. Adm. Code, are met.**

Effluent TSS data during May 2019 – November 2023 ranged between nondetectable at <2 to 8 mg/L. The Village of Clayton has a weekly effluent TSS monitoring frequency in the current permit where each sample is equivalent to a representative weekly average. **This effluent data shows the Village of Clayton can currently meet the updated TSS limits so a compliance schedule is not needed during the reissued permit term.**

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR AMMONIA NITROGEN

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

- Subchapter IV of ch. NR 106, Wis. Adm. Code allows limits based on available dilution instead of limits set to twice the acute criteria.
- The receiving water classification changed from LFF to a WWSF community.
- The receiving water low flows have increased.

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:

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

Where:

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

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 Village of Clayton and the limits are set based on the 1-Q_{10} method.

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

Daily Maximum Ammonia Nitrogen Limits – WWFF Community

Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L	Effluent pH s.u.	Limit mg/L
6.0 ≤ pH ≤ 6.1	60	7.0 < pH ≤ 7.1	36	8.0 < pH ≤ 8.1	7.6
6.1 < pH ≤ 6.2	59	7.1 < pH ≤ 7.2	32	8.1 < pH ≤ 8.2	6.3
6.2 < pH ≤ 6.3	57	7.2 < pH ≤ 7.3	29	8.2 < pH ≤ 8.3	5.2
6.3 < pH ≤ 6.4	56	7.3 < pH ≤ 7.4	25	8.3 < pH ≤ 8.4	4.3
6.4 < pH ≤ 6.5	54	7.4 < pH ≤ 7.5	22	8.4 < pH ≤ 8.5	3.5
6.5 < pH ≤ 6.6	52	7.5 < pH ≤ 7.6	19	8.5 < pH ≤ 8.6	2.9
6.6 < pH ≤ 6.7	49	7.6 < pH ≤ 7.7	16	8.6 < pH ≤ 8.7	2.4
6.7 < pH ≤ 6.8	46	7.7 < pH ≤ 7.8	13	8.7 < pH ≤ 8.8	2.0
6.8 < pH ≤ 6.9	43	7.8 < pH ≤ 7.9	11	8.8 < pH ≤ 8.9	1.7
6.9 < pH ≤ 7.0	40	7.9 < pH ≤ 8.0	9.2	8.9 < pH ≤ 9.0	1.5

Section NR 106.33(2), Wis. Adm. Code, was updated effective September 1, 2016. As a result, seasonal 20 and 40 mg/L thresholds for including ammonia limits in municipal discharge permits are no longer

applicable under current rules. **As such, the table has been expanded from the table in the current permit to included ammonia nitrogen limits throughout the pH range.**

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, because those limits relate to the assimilative capacity of the receiving water.

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

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

Where:

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

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

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. Burbot, an early spawning species, are not believed to be present in the Clayton Branch, based on the footnote in s. NR 106.32(3)(a)4, Wis. Adm. Code. So "ELS Absent" criteria apply from November – April, and "ELS Present" criteria will apply from May – October for a WWFF community.

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

Weekly and Monthly Ammonia Nitrogen Limits – WWFF Community

		May – Oct.	Nov. – April
Effluent Flow	Qe (MGD)	0.26	0.26
Background Information	7-Q_{10} (cfs)	0.05	0.05
	7-Q_2 (cfs)	0.13	0.13
	Ammonia (mg/L)	0.04	0.04
	Average Temperature (°C)	16	3.3

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		May – Oct.	Nov. – April
	Maximum Temperature (°C)	21	8.9
	pH (s.u.)	7.5	7.5
	% of Flow used	100	25
	Reference Weekly Flow (cfs)	0.05	0.01
	Reference Monthly Flow (cfs)	0.11	0.027
Criteria mg/L	4-day Chronic		
	Early Life Stages Present	7.39	
	Early Life Stages Absent		15.7
	30-day Chronic		
	Early Life Stages Present	2.96	
	Early Life Stages Absent		6.27
Effluent Limitations mg/L	Weekly Average		
	Early Life Stages Present	8.3	
	Early Life Stages Absent		16
	Monthly Average		
	Early Life Stages Present	3.8	
	Early Life Stages Absent		6.7

Effluent Data

Reasonable potential does not need to be demonstrated as daily maximum, weekly average, and monthly average ammonia nitrogen limits are effective in the current permit. Effluent ammonia nitrogen data from the current permit term during May 2019 – September 2023 is shown in the table below for informational purposes:

Ammonia Nitrogen Effluent Data

Statistics (mg/L)	May – October	November – April
1-day P_{99}	0.9	10
4-day P_{99}	0.5	5.4
30-day P_{99}	0.2	2.4
Mean*	0.07	1.1
Std	0.34	2.8
Sample size	90	31
Range	<0.1 - 1.4	<0.1 - 6.7

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

The permit currently has daily maximum, weekly average, and monthly average limits year round. **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.

In comparison of the updated limits against the current permit limits, the updated limits are all more stringent. **Therefore, these limits are recommended during the reissued permit term to protect the water quality of Clayton Branch.**

Conclusions and Recommendations

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

Final Ammonia Nitrogen Limits

Month Range	Daily Maximum mg/L	Weekly Average mg/L	Monthly Average mg/L
May – October	Variable	8.3	3.8
November – April	Variable	16	6.7

PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

The Village of Clayton had previously been exempted from disinfection based on the LAL or LFF 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., LFF, LAL - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for Clayton Branch at the old discharge location before 1978 is listed in ch. NR 104, Wis. Adm. Code, as a diffuse surface water. Discharges to diffuse surface waters that have very little to no flow most often result in effluent-dominated situations. As noted above, the risk of illness is related to the concentration of *E. coli* and therefore dilution is an important consideration when considering risk to human health. Since little to no dilution is present in these situations, disinfection should not be exempted based solely on this hydrological classification. This narrative is given for informational purposes since the current discharge (Outfall 004) has been found to discharge farther downstream on Clayton Branch.

It is recognized the Village of Clayton potentially has a detention time of at least 180 days, in which the resulting discharged effluent is thought to not pose a risk to human and animal heath, as described in s. NR 210.06(3)(h), Wis. Adm. Code. The maximum 180-day rolling average flowrate for the facility is 0.213 MGD (January 2019 – April 2024) including days discharge did not occur. The volumetric capacity of the lagoons is approx. 33.8 MG, calculated based on dimensions provided by the facility. Therefore, the estimated shortest detention time for the facility is approximately 33.8 MG / 0.213 MGD = 159 days and is less than the 180-day minimum. This detention time alone does not necessarily show a level of disinfection is achieved where additional disinfection treatment is not expected to be needed.

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

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

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

PART 6 – PHOSPHORUS

Technology-Based Effluent Limit

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

Because the Village of Webster does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 150 lbs/month, which is the threshold for municipalities in accordance with s. NR 217.04(1)(a)1, Wis. Adm. Code. **Therefore, the technology-based monthly average limit of 1.0 mg/L is not recommended during the reissued permit term.** In addition, the need for a WQBEL for phosphorus must be considered.

Annual Average Mass Total Phosphorus Loading

Month	Average Phosphorus Conc. (mg/L)	Total Effluent Flow (MG/month)	Calculated Mass (lbs/month)
Dec. 2022	0.65	1.2	6.3
April 2023	1.08	1.0	9.1
May 2023	1.24	4.7	49
June 2023	1.22	4.3	44
Sept. 2023	1.01	5.7	48
Oct. 2023	1.83	5.6	85
Nov. 2023	0.65	1.2	6.3
		Average =	40

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

Water Quality-Based Effluent Limits (WQBEL)

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

The LSCB TMDL report was written to ensure that phosphorus water quality criteria are attained in Lake

St. Croix and are not necessarily protective of phosphorus water quality of other surface waterbodies in the TMDL area. Therefore, the need for a phosphorus WQBEL as described in s. NR 217.13, Wis. Adm. Code, must be considered in addition to any limits required by the TMDL report.

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

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 Clayton Branch.
Qs = 100% of the 7-Q_2 of 0.13 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 = 0.26 MGD = 0.40 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

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

The previous limit evaluation (March 2018) resulted in a WQBEL of 0.075 mg/L due to the receiving water flow being zero at what was then believed to be the current location of Outfall 004. Because Outfall 004 is considerably more downstream where assimilative capacity exists, a background phosphorus concentration will be determined as described in s. NR 217.13(2)(d), Wis. Adm. Code.

In stream total phosphorus data upstream of the discharge is not available however the following data were considered in estimating the background phosphorus concentration:

Background Phosphorus Values

SWIMS ID	10052208	10052087	493196
Station Name	Apple R at 19 ½ Ave	Staples Creek at 20 ½ Ave	Nepadoggen Creek at Magnor Lk Outlet
Waterbody	Apple River	Staples Creek	Nepadoggen Creek
Sample Count	12	12	10
First Sample	05/04/2019	05/04/2019	05/22/2018
Last Sample	10/16/2019	10/16/2019	09/09/2019
Mean	0.111 mg/L	0.251 mg/L	0.072 mg/L
Median	0.099 mg/L	0.234 mg/L	0.071 mg/L

Substituting a background concentration above criteria into the limit calculation equation above would result in a calculated limit that is less than the applicable criterion of 0.075 mg/L. However, s. NR 217.13(7), Wis. Adm. Code, specifies that "if the WQBEL calculated pursuant to the procedures in this section is less than the phosphorus criterion specified in s. NR 102.06, Wis. Adm. Code, for the water body, the effluent limit shall be set equal to the criterion."

The facility may opt to sample the receiving water upstream of Outfall 004. The WQBEL may be amended if background phosphorus stream data, collected during the period of May – October and with regards to other stipulations laid out in s. NR 217.13(2)(d), Wis. Adm. Code, is submitted to the department that shows the upstream concentration of Total Phosphorus is in fact less than the applicable criterion. For informational purposes only, the following table shows a range of limits based on possible background concentrations. This calculation is based on effluent flow 0.26 MGD and stream flow (7-Q_2) of 0.13cfs at the criterion of 0.075 mg/L in accordance with s. NR 217.13(2), Wis. Adm. Code.

Total Phosphorus Background Concentrations & Limits

Upstream 'Concentrations' mg/L	Corresponding P Limit mg/L
0.02	0.093
0.03	0.089
0.04	0.086
0.05	0.083
0.06	0.080
0.07	0.077
> = 0.075	0.075

Effluent Data

Effluent phosphorus concentration data is shown in the table below from January 2021 – April 2024 since the phosphorus variance limit became effective in the permit on 01/01/2021.

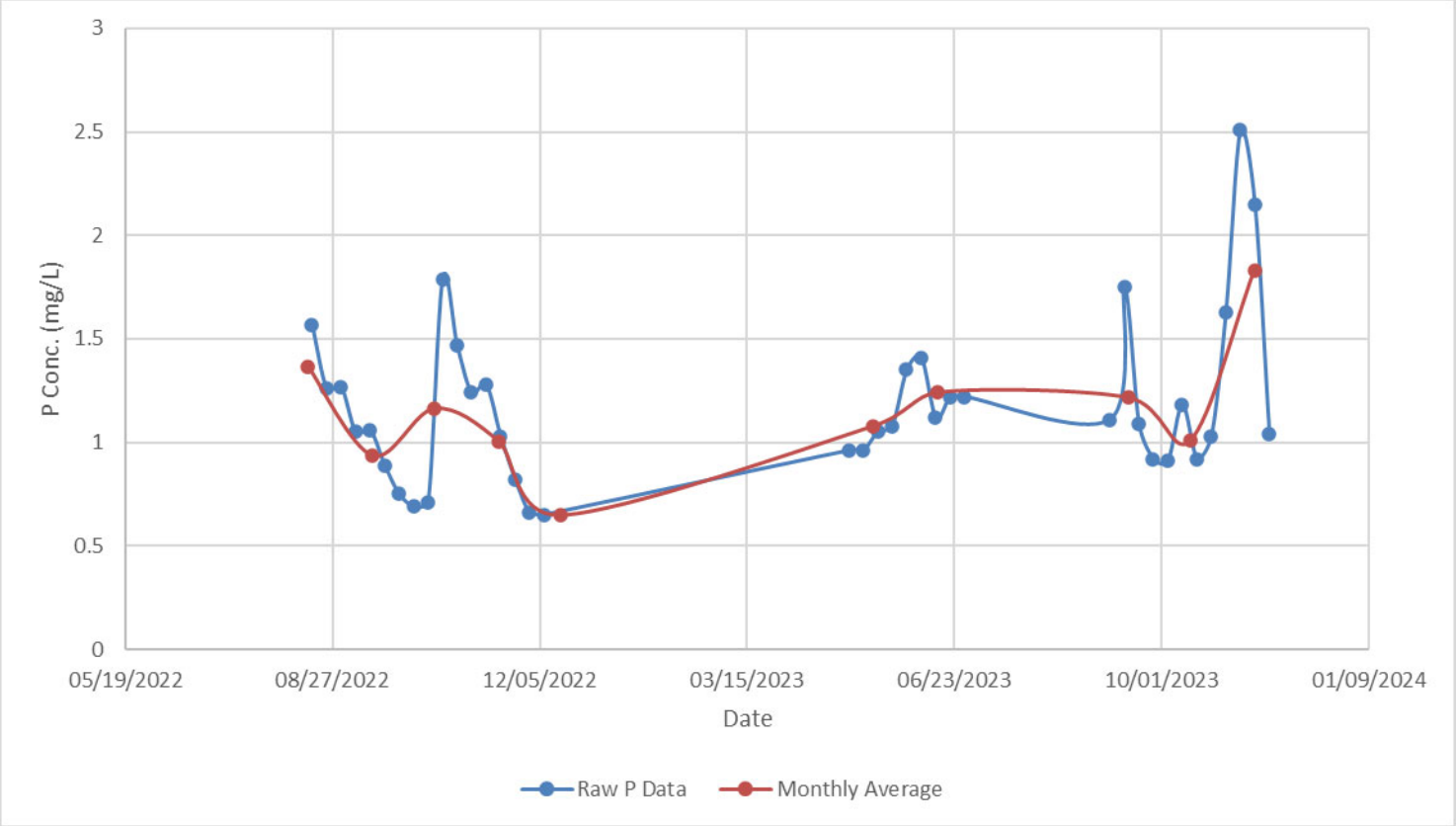
Total Phosphorus Effluent Data

Statistics	Conc. (mg/L)
1-day P_{99}	2.39
4-day P_{99}	1.71
30-day P_{99}	1.36
Mean	1.18
Std	0.40
Sample size	38
Range	0.65 - 2.51

Reasonable potential is not evaluated for the need of the phosphorus WQBEL in the permit because the Village of Clayton is already under a phosphorus variance to meet the phosphorus WQBELs in the future. The graph below shows the same effluent phosphorus data as both raw data and calculated monthly averages:

Attachment #1

Total Phosphorus Effluent Data Graph



Limit Expression

According to s. NR 217.14(2), Wis. Adm. Code, because the calculated WQBEL is less than or equal to 0.3 mg/L, **the effluent limit of 0.075 mg/L may be expressed as a 6-month average.** If a concentration limitation expressed as a six-month average is included in the permit, **a monthly average concentration limitation of 0.23 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.

TMDL Limits

The phosphorus mass limit is based on the TMDL study for Lake St. Croix to address phosphorus water quality impairments for Lake St. Croix. The TMDL report was approved by EPA on August 8, 2012. The Village of Clayton is included in a group of permitted facilities subject to an aggregate phosphorus wasteload allocation of 6,932 lbs/yr (3,151 kg/yr) under the Lake St. Croix TMDL report. The facility will be considered in compliance with its Lake St. Croix TMDL allocation if the phosphorus discharged from the facility is less than the permittee's individual allocation of 240 kg/yr (528 lbs/yr) or the total annual loading from all permittees in the aggregate category is less than the aggregate allocation.

The TMDL report states that point sources covered by the aggregate loading cap will be deemed as meeting the aggregate WLA as long as the sum of effluent loads from all 13 point sources remains under the aggregate load cap. According to the TMDL report's implementation recommendations, when the

total loading from all 13 point sources equals or exceeds 85% of the aggregate loading cap, permittees exceeding their individual share of the aggregate loading cap should receive individual WLAs.

A review of the calculated 12-month rolling sums of monthly phosphorus loads (n = 49, January 2019 – December 2023) show the Village of Clayton was always below its annual WLA. The maximum value was 369 lbs/yr during the January 2019 – December 2019 rolling 12-month period. **Therefore, individual WLAs will not be included initially in the permits for those facilities covered by the TMDL study's aggregate loading cap. However, the reissued permit should contain requirements for monitoring effluent phosphorus to calculate and report monthly phosphorus loads and 12-month rolling sums of monthly phosphorus loads.** Monthly loads are calculated using the monthly average phosphorus concentration and the total effluent flow for the month.

Variance Request
The existing permit contains a variance to the phosphorus WQBELs granted in accordance with s. 283.15, Wis. Stats. to meet the monthly average variance limit of 2.0 mg/L by 01/01/2021 in progress of meeting the final phosphorus WQBELs in the future. The facility has reapplied for an individual variance under s. 283.15, Wis. Stats. Eligibility for the variance is not included as part of this review. If a variance is granted and approved by US Environmental Protection Agency**, the variance limit of 2.4 mg/L as a daily maximum as required in s. NR 217.19(4)(a)1, Wis. Adm. Code, is recommended beyond the end of the compliance schedule, equivalent to the 1-day P_{99}. The monthly average variance limit of 2.0 mg/L is recommended to continue during the reissued permit term.**

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in 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 May 2019 – November 2023.

The heat loss equation as described by s. NR 106.55(5), Wis. Adm. Code, is used for discharges to storm sewer/storm water conveyance channels where the default cooling rate is estimated as 1 ºF per 400 ft and is used to estimate the given cooling over the 2,500 ft of effluent pipe from the facility to Outfall 004. This is considered conservative for open-channel flow especially during the winter months where the heat loss is expected to be more significant than estimated.

The table below summarizes the maximum temperatures reported during monitoring from August 2022 – December 2022 along with the calculated, cooling-adjusted, limits. The complete thermal table used for the limit calculation is included as attachment #3.

Attachment #1

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
AUG	73	73	88	91
SEP	74	74	80	89
OCT	65	65	68	87
NOV	49	53	56	84
DEC	41	41	56	84

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, temperature limits are not recommended during the reissued permit term. Monthly temperature monitoring for 1 year is recommended during the reissued permit term to have updated temperature data to determine the need for temperature limits at the next permit issuance.**

PART 8 – WHOLE EFFLUENT TOXICITY (WET)

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

judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022).*

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

- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 97% shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

Q_e = annual average flow = 0.26 MGD = 0.40 cfs
f = fraction of the Q_e withdrawn from the receiving water = 0
Q_s = ¼ of the 7-Q_{10} = 0.05 cfs ÷ 4 = 0.13 cfs

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

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 004 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.

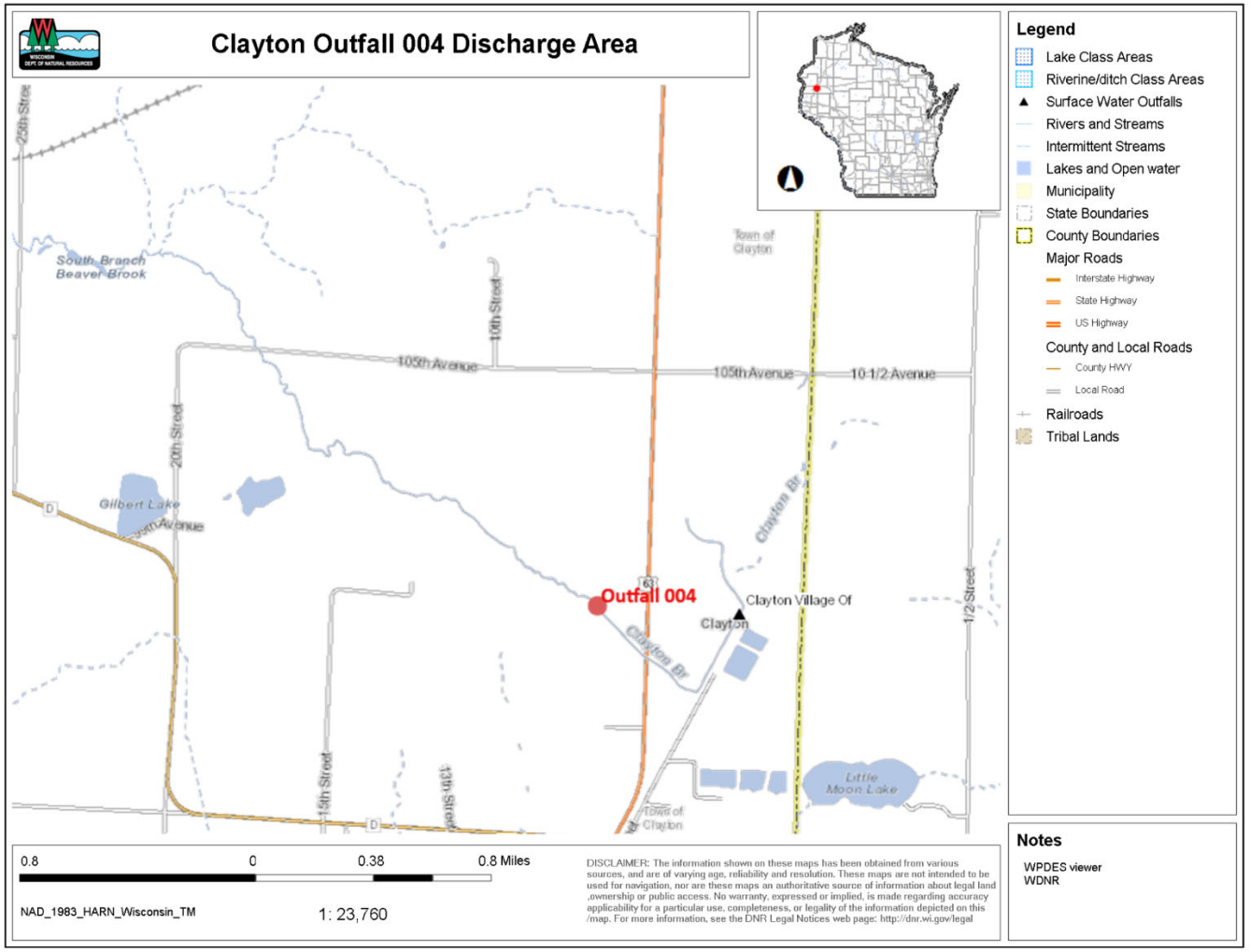
The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the 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 = 97%. **15 Points**
Historical Data	No historic acute tests. **5 Points**	No historic chronic tests. **5 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as acute. **0 Points**
Receiving Water Classification	WWSF community. **5 Points**	Same as acute. **5 Points**
Chemical-Specific Data	No reasonable potential for limits for based on ATC; ammonia nitrogen limit carried over from the current permit. Additional Compounds of Concern: No. **1 Point**	No reasonable potential for limits for based on CTC; ammonia nitrogen limit carried over from the current permit. Additional Compounds of Concern: No. **1 Point**
Additives	No biocides and 1 water quality conditioners added. Permittee has proper P chemical SOPs in place: No. **16 Points**	All additives used more than once per 4 days. **16 Points**
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:	**27 Points**	**42 Points**
Recommended Monitoring Frequency (from Checklist):	Three acute tests during permit term.	Annual chronic 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, **3x acute and annual chronic WET tests are recommended in the reissued permit.** Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued). **If a satisfactory phosphorus chemical SOP is established and implemented at the facility prior to permit reissuance, then WET testing can be reduced to 3x chronic tests in the reissued permit.**


Clayton Outfall 004 Discharge Area
Legend
Lake Class Areas
Riverine/ditch Class Areas
Surface Water Outfalls
Rivers and Streams
Intermittent Streams
Lakes and Open water
Municipality
State Boundaries
County Boundaries
Major Roads
Interstate Highway
State Highway
US Highway
County and Local Roads
County HWY
Local Road
Railroads
Tribal Lands
Notes
WPDES viewer
WDNR
Outfall 004
Clayton Village Of
Clayton
South Branch Beaver Brook
Gilbert Lake
105th Avenue
10th Street
20th Street
15th Street
139th Street
Clayton Br
Little Moon Lake
Town of Clayton
0.8
0
0.38
0.8 Miles
NAD_1983_HARN_Wisconsin_TM
1: 23,760
DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ,ownership or public access. No warranty, expressed or implied, is made regarding accuracy applicability for a particular use, completeness, or legality of the information depicted on this /map. For more information, see the DNR Legal Notices web page: http://dnr.wi.gov/legal

Attachment #3

Temperature Limits for Receiving Waters with Unidirectional Flow

(calculation using default ambient temperature data)

						Temp Dates	Flow Dates
Facility:	Village of Clayton		**7-Q10:**	0.05	cfs		
Outfall(s):	004		**Dilution:**	25%		**Start:**	08/17/22	05/07/19
Date Prepared:	5/21/2024		**f:**	0		**End:**	12/07/22	11/27/23
Design Flow (Qe):	0.26	MGD	**Stream type:**	Small warm water sport or forage fish co			
Storm Sewer Dist.	2500	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		**Adjusted Thermal Limits**	
	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	**Weekly Average**	**Daily Maximum**
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)	(°F)	(°F)
AUG	67	81	84	0.05	0.288	0.292	0	73	73	81	84	88	91
SEP	60	73	82	0.05	0.246	0.260	0	74	74	73	83	80	89
OCT	50	61	80	0.05	0.252	0.259	0	65	65	61	81	68	87
NOV	40	49	77	0.05	0.253	0.260	0	49	53	49	78	56	84
DEC	35	49	76	0.05	0.221	0.260	0	41	41	50	77	56	84

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

Tony Evers, Governor

Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711

WISCONSIN DEPT. OF NATURAL RESOURCES

9/17/2024

Sheldon Donath
PO Box 274
Clayton, WI 54004

Subject: Conditional approval of a multi-discharger phosphorus variance
Receiving Stream: Clayton Branch in Polk County
Permittee: Village of Clayton, WPDES WI-0036706

Dear Mr. Donath:

In accordance with s. 283.16 of the Wisconsin Statutes, you have requested coverage under Wisconsin's multi-discharger phosphorus variance for the Village of Clayton Wastewater Treatment Facility in an application dated 9/10/2024. 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 Mark Van Weelden, Cedar Corporation
Sheri Snowbank, WDNR
Carson Johnson, 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 Clayton

WPDES Permit Number	County
WI- 0 | 0 | 3 | 6 | 7 | 0 | 6	Polk

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

7. What is the current effluent level achievable?

Outfall Number(s)	Conc. (mg/L)	Method for calculation:	Does this concur with application?	
004	1.33	(•) 30-day P99 ( ) Other, specify:	( ) Yes (•) No, why not: Application used broader dataset	*DNR staff should verify the effluent concentration value(s) provided. See Q11 on municipal form & Q12 on industrial form.*

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

1.0 mg/L as a monthly average pursuant to s. 283.16(6)(am), Wis. Stats.
Target value = 0.2 mg/L
Facility upgrades or optimization may be required to meet the interim limit

Provide Rationale:

Effluent phosphorus data from the prior three years (8/1/2021 - 7/31/2024, n=67) yield a 30-day P99 value of 1.33 mg/L. A rounded value of 1.4 mg/L (monthly average) would represent a level currently achievable (LCA) interim limit. A schedule is likely needed prior to the 1.0 mg/L interim limit becoming effective. If the MDV is applied in future permit terms, the interim limit will be reevaluated based on highest attainable condition.

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.

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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:	$ 1,772,947.00 Adjusted NPV from 2017 site specifc cost estimate	*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 March 31, 2017 was authored by Cedar Corporation and submitted on behalf of the Village of Clayton. The report evaluated alternative compliance options for phosphorus, as well as estimated compliance costs for installation of tertiary filtration. Regionalization and alternative discharge locations were deemed technically or economically infeasible due to various factors including length of force main pipe required. Water quality trading was found to be infeasible due to lack of trading partners. All options were limited by limited/no capacity to further increase sewer rates. Throughout the most recent permit term, the facility addressed phosphorus via an individual phosphorus variance. Under the individual phosphorus variance, the Village pursued source reduction measures and in-plant optimization related to chemical feed and the new pond #4. With proven phosphorus treatment and additional capacity for costs, the Village has transitioned from individual to multi-discharger variance.

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

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Comments on economic demonstration:

The 2024 MDV application relies on the FCAP analysis completed in 2017. Costs for tertiary treatment were $1,078,900 in 2017 and were inflation-adjusted upwards for 2024, resulting in capital costs of $1,594,027. O&M cost increases were estimated at $14,885 per year. Assuming a 20-year CWFP loan at 2.1 % interest, payments on capital costs would amount to $97,676 annually. Total annual costs with O&M included come to $112,561. With a 90% residential use rate, costs borne by households are $101,304.90 annually. This cost, divided amongst 259 user households results in a per-user cost increase of $391.14 annually. Current rates are $731.41 annually. Future rates would be $1,122.55, or 2.06 % of the user-weighted $54,541 median household income. In Polk County with a secondary indicator score of 6, sewer rates at 1% of MHI meet the primary screener. The applicant meets the primary screener.

15. What watershed option was selected?

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

Section 4. Watershed Plan Review

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

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

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

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

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

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

Comments:

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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 Sign Clear

Date: 9/17/2024

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