

Permit Fact Sheet

General Information

Permit Number:	WI-0021466-10-0	
Permittee Name:	City of Clintonville	
Address:	350 E 15th St	
City/State/Zip:	Clintonville WI 54929	
Discharge Location:	West bank of the Pigeon River, 100yd SE of 15th St & Staff Sergeant Warren Hanson Dr, in Waupaca County	
Receiving Water:	Pigeon River	
StreamFlow (Q7,10):	8.4 cfs	
Stream Classification:	Warm Water Forage Fish community, non-public water supply	
Discharge Type:	Existing continuous	
Design Flow(s)	Annual Average	0.679 MGD
Significant Industrial Loading?	None. Creative Converting, Inc. is an industrial discharger.	
Operator at Proper Grade?	Yes. Jenny Pagel, Certified Operator, is an Advanced classification rating level OIC, certified in subclasses A1, B, C, P, D, and L.	
Approved Pretreatment Program?	N/A	

Facility Description

The City of Clintonville owns and operates an advanced secondary wastewater treatment facility. Construction is nearly complete for a major facility upgrade. Improvements include: rehab and generator connections to four collection system lift-stations, influent submersible pump lift station and pumps, influent rotary-drum screening unit and building, two anaerobic selector-basins and mixers, surface disc aeration equipment for the existing 3-channel oxidation ditch, recycle denitrification pump, phosphorus removal chemical pumps, polymer feed sludge thickening system and pump, waste sludge tank and load-out system, flow-proportional samplers, service building, etc. Biological treatment is provided in an oxidation ditch and phosphorus removal is provided by chemical addition. Disinfection is provided seasonally via ultraviolet radiation. Effluent is discharged on a continuous basis via Outfall 001 to the west bank of the Pigeon River, approx. 100 yd southeast of 15th St & Staff Sergeant Warren Hanson Dr intersection.

Substantial Compliance Determination

Enforcement During Last Permit: After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on May 1, 2023, this facility has been found to be in substantial compliance with their current permit.

Compliance determination entered by: Roy Van Gheem, Wastewater Engineer, on May 7, 2023.

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	0.604 MGD (5/1/18 - 4/30/24)	INFLUENT: 24-hr flow proportional composite samples shall be collected in the influent channel on the discharge side of the parshall flume after screening and grit removal.
001	0.572 MGD (5/1/18 - 4/30/24)	EFFLUENT: 24-hr flow proportional composite samples shall be collected in the effluent channel after the UV equipment before the weir. Grab samples shall be collected after the weir in the effluent channel prior to discharge to the Pigeon River.
002	102 metric tons (2018-2023)	LIQUID SLUDGE: Class B, aerobically digested, thickened sludge shall have samples collected from the discharge pipe of the sludge mixing pump after complete mixing.

1 Influent – Monitoring Requirements

Sample Point Number: 701- Influent

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

Changes from Previous Permit:

No changes from previous permit.

Explanation of Monitoring Requirements

BOD5 and Total Suspended Solids: Influent monitoring is needed to assess loading to the facility and treatment performance. Requirements for flow, BOD, and TSS are established in accordance with ch. NR 210.04(2), Wis. Adm. Code.

2 Surface Water - Monitoring and Limitations

Sample Point Number: 001- Effluent

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	314 lbs/day	3/Week	Calculated	
Suspended Solids, Total	Monthly Avg	182 lbs/day	3/Week	Calculated	
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of suspended solids and report on the last day of the month on the DMR. See the "Total Maximum Daily Load (TMDL) Limitations" subsection below.
Suspended Solids, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of suspended solids discharged. See the "Total Maximum Daily Load (TMDL) Limitations" subsection for more information.
pH Field	Daily Max	9.0 su	5/Week	Grab	
pH Field	Daily Min	6.0 su	5/Week	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit Effective May through September, annually.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit Effective May through September, annually. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	See Table	Look up the variable ammonia limit from the 'Variable Ammonia Limitation' table and report the variable limit in the Ammonia Variable Limit column on the eDMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	24-Hr Flow Prop Comp	Report the daily maximum Ammonia result in the Nitrogen, Ammonia (NH3-N) Total column of the eDMR. See Ammonia Limitation Section.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	20 mg/L	2/Week	24-Hr Flow Prop Comp	Effective January - March, annually.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	23 mg/L	2/Week	24-Hr Flow Prop Comp	Effective April - May, annually.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	34 mg/L	2/Week	24-Hr Flow Prop Comp	Effective June, annually.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	33 mg/L	2/Week	24-Hr Flow Prop Comp	Effective July - September, annually.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	22 mg/L	2/Week	24-Hr Flow Prop Comp	Effective October - December, annually.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	11 mg/L	2/Week	24-Hr Flow Prop Comp	Effective January - March, annually.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	14 mg/L	2/Week	24-Hr Flow Prop Comp	Effective April - May, annually.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	16 mg/L	2/Week	24-Hr Flow Prop Comp	Effective June - September, annually.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	12 mg/L	2/Week	24-Hr Flow Prop Comp	Effective October - December, annually.
Phosphorus, Total	Monthly Avg	0.5 mg/L	Weekly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Phosphorus, Total	6-Month Avg	1.1 lbs/day	Weekly	Calculated	Compliance is evaluated every six-months on April 30 and October 31.
Phosphorus, Total	Monthly Avg	3.2 lbs/day	Weekly	Calculated	
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See the "Total Maximum Daily Load (TMDL) Limitations" subsection below.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged. See the "Total Maximum Daily Load (TMDL) Limitations" subsection for more information.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring in 2028.
Temperature		deg F	Daily	Continuous	Monitoring in 2028.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring Section.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring Section.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Monitoring Series section. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.

Changes from Previous Permit

E. Coli: Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

Nitrogen, Ammonia (NH₃-N) Total: Weekly average limit for July – September is reduced from 34 mg/L to 33 mg/L. Weekly average limit for October – December is reduced from 23 mg/L to 22 mg/L.

Phosphorus: Addition of TMDL limits; Monthly average of 3.2 lbs/day and 6-Month average of 1.1 lbs/day.

Total Suspended Solids: Addition of TMDL limits: Weekly average of 314 lbs/day and Monthly average of 182 lbs/day.

Chloride: Monthly monitoring added in 2028.

Arsenic: No monitoring is required at this time.

Temperature: Daily monitoring added in 2028.

Total Nitrogen Monitoring (TKN, N₀₂+N₀₃ and Total N): Annual monitoring in rotating quarters throughout the permit term was added to the proposed permit.

Explanation of Limits and Monitoring Requirements

Please refer to the Water Quality Based Effluent Limitations memo for the Clintonville Wastewater Treatment Facility prepared by Michael Polkinghorn dated June 6, 2024, and used for this reissuance.

BOD₅, TSS, and pH: No changes are recommended in the categorical permit limitations for BOD₅, TSS and pH. Because the reference effluent flow rates and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time. Where the receiving water is classified as fish and aquatic life (Warm Water Sport Fish in this case) as defined in s. NR 102.04(3)(b), Wis. Adm. Code the categorical limits for BOD₅, TSS, and pH are those limits enumerated in ss. NR 210.05(1)(a)-(c), Wis Adm. Code.

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. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for E. coli while facilities are disinfecting during the recreation period, and establish effluent limitations for E. coli established in s. NR 210.06 (2), Wis. Adm Code. The administrative code rule changes included the following actions: revised the bacteria water quality criteria from fecal coliform to E. coli to protect recreation in ch. NR 102, Wis. Adm. Code.; removed fecal coliform criteria for certain individual waters from ch. NR 104, Wis. Adm. Code.; revised permit requirements for publicly and privately owned sewage treatment works in ch. NR 210, Wis. Adm. Code.; and, updated approved analytical methods for bacteria in ch. NR 219, Wis. Adm. Code. E. coli limits of 126 #/100 ml as a monthly geometric mean that may not be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply.

Ammonia: Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106, Wis. Adm. Code establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia. Variable daily limits will continue this permit term. The variable limits table remains the same, except the table has been expanded to include limits based on pH sample results between the full range of 6 and 9 s.u.. Monthly weekly average and monthly average limits will continue through the permit term except the weekly average limit for July – September is reduced from 34 mg/L to 33 mg/L and the weekly average limit for October – December is reduced from 23 mg/L to 22 mg/L.

Daily Maximum Ammonia Nitrogen Levels

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

Upper Fox Wolf River Total Maximum Daily Load (TMDL): The permitted facility is located within the Upper Fox Wolf River Basin Total Maximum Daily Load (UFWRB TMDL), which was approved by EPA February 27, 2020. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amounts of phosphorus and total suspended solids that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from and comply with the applicable water quality criterion and are consistent with the assumptions and requirements of the EPA-approved WLAs in the TMDL. More information about the TMDL can be found at <https://dnr.wisconsin.gov/topic/TMDLs/TMDLReports.html>

Phosphorus - Based on current criteria, the approved TMDL Waste Load Allocation (WLA) for Total Phosphorus is 330 lbs per year and 0.9 lbs/day, which equates to 3.2 lbs/day monthly average and 1.1 lbs/day as a 6-month average. (Note: the six-month average effluent limit periods are May through October and November through April.). The concentration limit of 0.5 mg/L will continue this permit term based on anti-backsliding requirements (ch. NR 207, Wis. Adm. Code).

Total Suspended Solids - Based on current criteria, the approved TMDL Waste Load Allocation (WLA) for Total Phosphorus is 33,878 lbs per year and 93 lbs per day, which equates to 314 lbs/day weekly average and 182 lbs/day monthly average.

Calculation and reporting of the total mass of phosphorus and total suspended solids 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. Recording will begin after 12-months (October 2025).

Chloride: Considering available effluent data from the current permit term (May 2022 – June 2022), the mean effluent concentration is 184 mg/L. This effluent concentrations is below the calculated chloride WQBELs; therefore, limits are not required during the reissued permit term. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.

Arsenic: No monitoring is required at this time, however, a different approved analytical method is recommended for future samples for arsenic such that the limit of detection is less than or equal to 22 µg/L to better determine the need for arsenic limits at the next permit reissuance.

Temperature: 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 2018 – April 2024. Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. Based on this analysis, temperature limits are not recommended during the reissued permit term. Daily temperature monitoring for one year is required during the reissued permit term to have updated temperature data to determine the need for temperature limits at 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.

PFAS: 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 in their effluent as part of this permit reissuance. The department may re-evaluate the need for sampling at the next permit reissuance if new information becomes available that suggests PFOS or PFOA may be present in the discharge.

Monitoring Frequency: The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure 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.

The Department has been revisiting the sampling frequencies at every facility to evaluate whether current frequencies are appropriate or if an increase is warranted. The frequencies for pH and phosphorus were increased to align Clintonville with other facilities of similar size to ensure fairness and in consideration of department guidance of sample frequencies. Requirements in administrative code (NR 108, 205, 210 and 214 Wis. Adm. Code) and Section 283.55, Wis. Stats., were considered, where applicable, when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. The department has determined at this time that the aforementioned changes in monitoring frequency are warranted based on the size and type of the facility.

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)
002	Class B	Liquid	Fecal Coliform	Injection	Land Apply	103 dry US tons
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? N/A						

Sample Point Number: 002- Liquid Sludge

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Analysis required in 2025. See Sections 3.2.1.5 and 5.5.6 for monitoring requirements.
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Analysis required in 2025. See Sections 3.2.1.5 and 5.5.6 for monitoring requirements.
PFOA + PFOS		ug/kg	Annual	Calculated	Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information.
PFAS Dry Wt			Annual	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.

Changes from Previous Permit:

PFAS – Annual monitoring is included in the permit pursuant s. NR 204.06(2)(b)9., Wis. Adm. Code.

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. Limitations for PCBs are addressed in s. NR 204.07(3)(k).

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk

assessment by the end of 2024. In the interim, the department has developed the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS”.

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

4 Schedules

4.1 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
<p>Land Application Management Plan Submittal: Submit an update to the management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading 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.</p>	<p>09/30/2025</p>

Explanation of Schedules

Permittee shall submit an update to the management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by September 30, 2025.

Attachments:

Water Quality-Based Effluent Limitations for the Clintonville Wastewater Treatment Facility - WPDES Permit No. WI- 0021466-10-0

Expiration Date:

September 30, 2029

Justification Of Any Waivers From Permit Application Requirements

No waivers from permit application requirements granted.

Prepared By: Sarah Adkins Wastewater Specialist

Date: August 15, 2024

CORRESPONDENCE/MEMORANDUM

DATE: June 6, 2024

TO: Sarah Adkins – NER/Oshkosh Service Center

FROM: Michael Polkinghorn – NOR/Rhineland Service Center *Michael Polkinghorn*

SUBJECT: Water Quality-Based Effluent Limitations for the Clintonville Wastewater Treatment Facility
 WPDES Permit No. WI-0021466-10-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from the Clintonville Wastewater Treatment Facility in Waupaca County. This municipal wastewater treatment facility (WWTF) discharges to the Pigeon River, located in the Pigeon River Watershed in the Wolf River Basin. This discharge is included in the Upper Fox/Wolf Rivers Basin (UFWRB) Total Maximum Daily Load (TMDL) as approved by EPA on 02/27/2020. 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 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅			45 mg/L	30 mg/L		1, 2
TSS			45 mg/L 314 lbs/day	30 mg/L 182 lbs/day		2, 3
pH	9.0 s.u.	6.0 s.u.				1, 2
<i>E. coli</i> May – September				126 #/100 mL geometric mean		4
Ammonia Nitrogen Year round January – March April – May June July – September October – December	Variable		20 mg/L 23 mg/L 34 mg/L 33 mg/L 22 mg/L	11 mg/L 14 mg/L 16 mg/L 16 mg/L 12 mg/L		5, 6
Phosphorus				0.5 mg/L 3.2 lbs/day	1.1lbs/day	3, 7
Chloride						8
Arsenic (Total Recoverable)						9
Temperature						8
TKN, Nitrate+Nitrite, and Total Nitrogen						10

Footnotes:

1. No changes from the current permit.

2. These limits are based on the Warm Water Forage Fish community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
3. The total suspended solids (TSS) and phosphorus mass limits are based on the TMDL for the UFWRB to address TSS and phosphorus water quality impairments within the TMDL area.
4. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
5. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
6. 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 ≤ pH ≤ 6.1	108	7.0 < pH ≤ 7.1	66	8.0 < pH ≤ 8.1	14
6.1 < pH ≤ 6.2	106	7.1 < pH ≤ 7.2	59	8.1 < pH ≤ 8.2	11
6.2 < pH ≤ 6.3	104	7.2 < pH ≤ 7.3	52	8.2 < pH ≤ 8.3	9.4
6.3 < pH ≤ 6.4	101	7.3 < pH ≤ 7.4	46	8.3 < pH ≤ 8.4	7.8
6.4 < pH ≤ 6.5	98	7.4 < pH ≤ 7.5	40	8.4 < pH ≤ 8.5	6.4
6.5 < pH ≤ 6.6	94	7.5 < pH ≤ 7.6	34	8.5 < pH ≤ 8.6	5.3
6.6 < pH ≤ 6.7	89	7.6 < pH ≤ 7.7	29	8.6 < pH ≤ 8.7	4.4
6.7 < pH ≤ 6.8	84	7.7 < pH ≤ 7.8	24	8.7 < pH ≤ 8.8	3.7
6.8 < pH ≤ 6.9	78	7.8 < pH ≤ 7.9	20	8.8 < pH ≤ 8.9	3.1
6.9 < pH ≤ 7.0	72	7.9 < pH ≤ 8.0	17	8.9 < pH ≤ 9.0	2.6

7. The concentration-based phosphorus limit is a WQBEL as described in s. NR 217.13, Wis. Adm. Code.
8. Monthly monitoring for 1 year is recommended during the reissued permit term.
9. A different approved analytical method is recommended for future samples for arsenic such that the limit of detection is less than or equal to 22 µg/L to better determine the need for arsenic limits at the next permit reissuance.
10. 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 (NO₃), nitrite (NO₂), and total Kjeldahl nitrogen (TKN) (all expressed as N).

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

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

Attachments (4) – Narrative, discharge area map, weekly/monthly average ammonia nitrogen limit calculations, & thermal table.

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**Water Quality-Based Effluent Limitations for
Clintonville Wastewater Treatment Facility**

WPDES Permit No. WI-0021466-10-0

Prepared by: Michael A. Polkinghorn

PART 1 – BACKGROUND INFORMATION

Facility Description

The City of Clintonville owns and operates an advanced secondary wastewater treatment facility. Construction is nearly complete for a major facility upgrade. Improvements include: rehab and generator connections to four collection system lift-stations, influent submersible pump lift station and pumps, influent rotary-drum screening unit and building, two anaerobic selector-basins and mixers, surface disc aeration equipment for the existing 3-channel oxidation ditch, recycle denitrification pump, phosphorus removal chemical pumps, polymer feed sludge thickening system and pump, waste sludge tank and load-out system, flow-proportional samplers, service building, etc. Biological treatment is provided in an oxidation ditch and phosphorus removal is provided by chemical addition. Disinfection is provided seasonally via ultraviolet radiation. Effluent is discharged on a continuous basis via Outfall 001 to the west bank of the Pigeon River, approx. 100 yd southeast of 15th St & Staff Sergeant Warren Hanson Dr intersection.

Attachment #2 is a discharge area map of Outfall 001.

Existing Permit Limitations

The current permit, expired on 03/31/2023, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1
BOD ₅			45 mg/L	30 mg/L	2, 3
TSS			45 mg/L	30 mg/L	2, 3
pH	9.0 s.u.	6.0 s.u.			2, 3
Fecal Coliform May – September			656#/100 mL geometric mean	400#/100 mL geometric mean	4
Ammonia Nitrogen Year round January – March April – May June – September October – December	Variable		20 mg/L 23 mg/L 34 mg/L 23 mg/L	11 mg/L 14 mg/L 16 mg/L 13 mg/L	4, 5
Phosphorus Interim				1.0 mg/L	6

Attachment #1

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Final				0.5 mg/L	

Footnotes:

1. Monitoring only.
2. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
3. These limits are based on the Warm Water Forage Fish community of the immediate receiving water as described in s. NR 210.05(1), Wis. Adm. Code.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
5. The variable daily maximum ammonia nitrogen limit table corresponding to various effluent pH values may be included in the permit in place of the single limit. These limits apply year-round.

Daily Maximum Ammonia Nitrogen Limits

Effluent pH – s.u.	Daily Max. Ammonia Limit – mg/L	Effluent pH – s.u.	Daily Max. Ammonia Limit – mg/L
		8.2 < pH ≤ 8.3	9.4
pH ≤ 7.5	> 34	8.3 < pH ≤ 8.4	7.8
7.5 < pH ≤ 7.6	34	8.4 < pH ≤ 8.5	6.4
7.6 < pH ≤ 7.7	29	8.5 < pH ≤ 8.6	5.3
7.7 < pH ≤ 7.8	24	8.6 < pH ≤ 8.7	4.4
7.8 < pH ≤ 7.9	20	8.7 < pH ≤ 8.8	3.7
7.9 < pH ≤ 8.0	17	8.8 < pH ≤ 8.9	3.1
8.0 < pH ≤ 8.1	14	8.9 < pH ≤ 9.0	2.6
8.1 < pH ≤ 8.2	11	pH > 9.0	< 2.6

6. The monthly average phosphorus limit is a technology-based limit which also functioned as an interim limit for the phosphorus compliance schedule. A compliance schedule is in the current permit to meet the final QBEL by 04/01/2019.

Receiving Water Information

- Name: Pigeon River
- Waterbody Identification Code (WBIC): 293100
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Forage Fish (WWFF) community, non-public water supply. Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q₁₀ and 7-Q₂ values are from USGS for Station W44 or SE ¼, SE ¼, Section 23, T25N – R14E in Waupaca County, approx. 1.4 mi upstream of Outfall 001.
 - 7-Q₁₀ = 8.4 cubic feet per second (cfs)
 - 7-Q₂ = 16 cfs
 - Harmonic Mean Flow = 30.4 cfs using a drainage area of 109 mi²

Attachment #1

The Harmonic Mean has been estimated based on average flow and the 7-Q₁₀ using an equation from U.S. EPA's *Technical Support Document for Water Quality-Based Toxics Control* (March 1991, EPA/505/2-90-001, pgs. 88-89).

- Hardness = 272 mg/L as CaCO₃. This value represents the geometric mean of data (n = 4, October 2002 – May 2012) from historic whole effluent toxicity (WET) test data.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%.
- Source of background concentration data: Metals data from the Wolf River at New London, WI is used for this evaluation because there is no data available for the Pigeon River. The Wolf River is within the same ecological landscape so ambient water quality characteristics are expected to be similar. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations.
- Multiple dischargers: The City of Marion WWTF discharges to the North Branch Pigeon River approx. 8.3 mi upstream of Outfall 001. They are not in the immediate vicinity and the mixing zones do not overlap. Therefore, the other dischargers do not impact this evaluation.
- Impaired water status: The Pigeon River is on the Clean Water Act Section 303(d) list for a phosphorus impairment (stream mi 0 – 5.23). Outfall 001 is included the UFWRB TMDL area to address TSS and phosphorus impairments in the TMDL area.

Effluent Information

- Design flow rate(s):
Annual average = 0.679 million gallons per day (MGD)
For reference, the actual average flow from May 2018 – April 2024 was 0.572 MGD. The updated design flow from the permit application was listed in the O&M manual provided by Foth after the 2017 – 2018 facility upgrades. The previous limit evaluation (June 2015) used the annual average design flow of 0.636 MGD.
- Hardness = 352 mg/L as CaCO₃. This value represents the geometric mean of data (n = 4, May 2022 – June 2022) from the permit application.
- 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 the City of Clintonville wells.
- Total Phosphorus Wasteload Allocation: 330 lbs/year, 0.9 lbs/day (See page 9 of Appendix H of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids Upper Fox and Wolf Basins Report, February 27, 2020*).
- Total Suspended Solids Wasteload Allocation: 33,878 lbs/year, 93 lbs/day (See page 9 of Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids Upper Fox and Wolf Basins Report, February 27, 2020*).
- Additives: Alum for chemical phosphorus removal.
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus chloride and hardness.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Attachment #1

Chloride & Copper Effluent Data

Sample Date	Chloride (mg/L)	Copper (µg/L)
05/06/2022		6.1
05/10/2022		9.6
05/13/2022		7.5
05/17/2022		7.4
05/20/2022		7.3
05/23/2022		7.8
05/27/2022		8.2
05/31/2022	163	7.8
06/03/2022	192	16.0
06/07/2022	211	23
06/10/2022	171	15
Mean	184	
1-day P ₉₉		28
4-day P ₉₉		18

The following table presents the average concentrations and loadings at Outfall 001 from May 2018 – 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

	Average Measurement*
BOD ₅	6.8 mg/L
TSS	4.3 mg/L
pH field	7.6 s.u.
Fecal Coliform	6 #/100 mL
Ammonia Nitrogen	0.22 mg/L
Phosphorus	0.23 mg/L

*Any results below the level of detection (LOD) were included as zeroes in calculation of average.

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

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

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P₉₉) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q₁₀

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-Q₁₀ 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.

$$\text{Limitation} = \frac{(\text{WQC}) (Q_s + (1-f) Q_e) - (Q_s - f Q_e) (C_s)}{Q_e}$$

Where:

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

Q_s = average minimum 1-day flow which occurs once in 10 years (1-day Q₁₀)
 if the 1-day Q₁₀ flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q₁₀).

Q_e = 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

C_s = 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-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Clintonville WWTF and the limits are set based on two times the ATC.

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 6.7 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Arsenic		340	679.6	135.9	<28		<28
Cadmium	352	43.6	87.2	17.4	<0.3		<0.3
Chromium	301	4,446	8,891.7	1,778	<1.3		<1.3
Copper	352	50.8	101.7			28	23
Lead	352	360	720.7	144.1	<3.5		<3.5
Nickel	268	1,080	2,160.6	432	5.7		5.7
Zinc	333	345	689.4	137.9	42		42
Chloride (mg/L)		757	1,514.0	303	184		211

Attachment #1

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

** The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q₁₀ flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 2.1 cfs (¼ of the 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Arsenic		152.2		456	91.3	<28	
Cadmium	175	3.82	0.077	11.30	2.3	<0.3	
Chromium	272	299.51	0.691	897	179.4	<1.3	
Copper	272	24.34	0.955	71.1			18
Lead	272	73.56	0.247	220.1	44.0	<3.5	
Nickel	268	120.18		360	72.1	5.7	
Zinc	272	288.47	1.8	861	172.3	42	
Chloride (mg/L)		395	13.9	1,157	231.4	184	

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

Monthly Average Limits based on Wildlife Criteria (WC)

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

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 7.6 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cadmium	370	0.077	3044	608.8	<0.3
Chromium	3,818,000	0.691	31,418,910	6,283,782	<1.3
Lead	140	0.247	1,150	230.1	<3.5
Nickel	43,000		353,854	70,771	5.7

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 7.6 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3		109.4	21.89	<28

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent

limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, **effluent limitations are not recommended for any toxic substances during the reissued permit term.** Monitoring recommendations are made in the paragraphs below:

Arsenic – Considering available effluent data from June 2022, the mean effluent concentration is nondetectable at <28 µg/L. This is below 1/5th of the calculated arsenic WQBELs; **therefore, limits or monitoring are not recommended during the reissued permit term.** In addition, the limit of detection of the submitted sample for arsenic is <28 µg/L using the EPA 200.7 analytical method. This is higher than 1/5th of the calculated limit (22 µg/L) based on HCC and is not certain if a nondetect sample is actually lower than that value. **A different approved analytical method is recommended for future samples for arsenic such that the limit of detection is less than or equal to 22 µg/L to better determine the need for arsenic limits at the next permit reissuance.**

Chloride – Considering available effluent data from the current permit term (May 2022 – June 2022), the mean effluent concentration is 184 mg/L. This effluent concentrations is below the calculated chloride WQBELs; therefore, **therefore, limits are not recommended during the reissued permit term.. Chloride monitoring is recommended to ensure that 11 sample results are available at the next permit issuance to meet the data requirements of s. NR 106.85, Wis. Adm. Code.**

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.

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

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. The current permit has daily maximum, weekly average and monthly average limits 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 annual average design flow has increased from 0.636 to 0.679 MGD

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

Daily maximum limitations are based on ATC in ch. NR 105, Wis. Adm. Code, which are a function of the effluent pH and the receiving water classification. The ATC for ammonia is calculated using the following equation:

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

Where:

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

The current permit has the variable daily maximum effluent limits based on effluent pH using the 2 times the ATC calculation method. An initial review of the increased annual average design flow shows this method produces a more stringent limit than the 1-Q₁₀ calculation method as demonstrated in Part 2 of this evaluation. Therefore, changes to the daily maximum ammonia nitrogen limits are not made based on this reason. Presented below is a table of daily maximum limitations corresponding to various effluent pH values.

Daily Maximum Ammonia Nitrogen Limits – WWFF

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

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 include 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 CTC for ammonia, because those limits relate to the assimilative capacity of the receiving water. These limits were last calculated in the previous limit evaluation (June 2015) using the annual average design flow of 0.636 MGD. These limits will be recalculated using the updated annual average design flow of 0.679 MGD keeping other variables constant. The previous weekly/monthly average ammonia nitrogen WQBELs and the background variables are included as attachment #3.

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

Attachment #1

$$C = 1.45 \times 10^{(0.028 \times (25 - T))} - \text{(Early Life Stages Absent), and}$$

T = the temperature (°C) of the receiving water – (Early Life Stages Present), or

T = the maximum of the actual temperature (°C) 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-Q₁₀ (4-Q₃, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q₅ (estimated as 85% of the 7-Q₂ if the 30-Q₅ is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 °C, 25% of the flow is used if the Temperature < 11 °C, and 50% of the flow is used if the Temperature ≥ 11 °C but < 16 °C.

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 °C, during the winter and spring months. Burbot, an early spawning species, are believed to be present in the Pigeon River, based on fish survey data on the Pigeon River downstream of the Clintonville millpond. So “ELS Absent” criteria apply from October – December, and “ELS Present” criteria will apply from January – September for a WWFF community.

The background values used for temperature, pH and ammonia concentrations from the previous limit evaluation (June 2015) are shown in the table below, with the resulting criteria and effluent limitations.

Weekly & Monthly Ammonia Nitrogen Limits – WWFF

		April – June	July – Sept.	Oct. – Dec.	Jan. – March
Effluent Flow	Qe (MGD)	0.679	0.679	0.679	0.679
Background Information	7-Q ₁₀ (cfs)	8.4	8.4	8.4	8.4
	7-Q ₂ (cfs)	16	16	16	16
	Ammonia (mg/L)	0.04	0.03	0.11	0.11
	Temperature (°C)	18.9	20.6	10	3.3
	pH (s.u.)	8.09	8.08	8.06	7.90
	% of Flow used	100	100	25	25
	Reference Weekly Flow (cfs)	8.4	8.4	2.1	2.1
	Reference Monthly Flow (cfs)	13.6	13.6	3.4	3.4
Criteria mg/L	4-day Chronic				
	Early Life Stages Present	4.01	3.65		6.99
	Early Life Stages Absent			7.45	
	30-day Chronic				
	Early Life Stages Present	1.61	1.46		2.80
Early Life Stages Absent			2.98		
Effluent Limitations mg/L	Weekly Average				
	Early Life Stages Present	36	33		21
	Early Life Stages Absent			22	
	Monthly Average				
	Early Life Stages Present	22	20		11
Early Life Stages Absent			12		

Effluent Data

Reasonable potential does not need to be demonstrated as year round weekly and monthly average ammonia nitrogen limits are effective in the current permit. Effluent ammonia nitrogen data from the current permit term during May 2018 – April 2024 is shown in the table below for informational purposes:

Ammonia Nitrogen Effluent Data

Statistics (mg/L)	April – June	July – September	October – December	January – March
1-day P ₉₉	1.0	0.34	1.1	4.3
4-day P ₉₉	0.52	0.22	0.63	2.4
30-day P ₉₉	0.25	0.14	0.28	1.1
Mean*	0.14	0.10	0.13	0.51
Std	0.21	0.07	0.27	1.0
Sample size	231	234	233	227
Range	<0.03 - 1.4	<0.03 - 0.58	<0.03 - 2.4	<0.03 - 5.4

*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 more stringent for the weekly average limit during July – September (33 mg/L) and both weekly and monthly average limits during October – December (22 and 12 mg/L respectively). **Therefore, these limits are recommended during the reissued permit term to protect the water quality of the Pigeon River.**

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
April – May	Variable	23	14
June	Variable	34	16
July – September	Variable	33	16
October – December	Variable	22	12
January – March	Variable	20	11

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

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

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

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

Effluent Data

Clintonville WWTF has monitored effluent *E. coli* from May 2022 – September 2022 and a total of 22 results are available. A geometric mean of 126 counts/100 mL was never exceeded, with a maximum monthly geometric mean of 3 counts/100 mL. Effluent data has never exceeded 410 counts/100 mL, with a maximum reported sample of 9 counts/100 mL. **Based on this effluent data it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.**

PART 5 – PHOSPHORUS & TSS

Technology-Based Effluent Limit – Phosphorus

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.

The monthly average phosphorus WQBEL of 0.5 mg/L is effective in the current permit as of 04/01/2019 and is more stringent than the technology-based limit. **Therefore, a technology-based phosphorus limit is not recommended during the reissued permit term.** In addition, the need for a WQBEL for phosphorus must be considered.

TMDL Limits – Phosphorus

Total phosphorus (TP) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (April 2020) and are based on the annual phosphorus WLA given in pounds per year. This WLA found in Appendix H of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf River Basins (UFWRB TMDL)* report dated February 2020 are expressed as

maximum annual loads (lbs/year). For Clintonville WWTF, these phosphorus WLAs are 330 lbs/yr and 0.9 lbs/day.

For the reasons explained in the April 30, 2012 paper entitled *Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin*, WDNR has determined that the phosphorus WQBELs set equal to WLAs would not be consistent with the assumptions and requirements of the TMDL. Therefore, limits given to facilities included in the UFWRB TMDL are given monthly average mass limits and, if the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits are also included. The following equation shows the calculation of equivalent effluent concentration:

$$\begin{aligned} \text{TP Equivalent Effluent Concentration} &= \text{WLA} \div (\text{365 days/yr} * \text{Flow Rate} * \text{Conversion Factor}) \\ &= 330 \text{ lbs/yr} \div (\text{365 days/yr} * \text{0.679 MGD} * \text{8.34}) \\ &= 0.160 \text{ mg/L} \end{aligned}$$

Since this value is less than 0.3 mg/L, both a six-month average mass limit and a monthly average mass limit are applicable for total phosphorus. The monthly average limit is set equal to three times the six-month average limit.

$$\begin{aligned} \text{TP 6-Month Average Permit Limit} &= \text{WLA} \div \text{365 days/yr} * \text{multiplier} \\ &= (330 \text{ lbs/yr} \div \text{365 days/yr}) * \text{1.18} \\ &= 1.1 \text{ lbs/day} \end{aligned}$$

$$\begin{aligned} \text{TP Monthly Average Permit Limit} &= \text{TP 6-Month Average Permit Limit} * \text{3} \\ &= 1.1 \text{ lbs/day} * \text{3} \\ &= 3.2 \text{ lbs/day} \end{aligned}$$

The multiplier used in the six-month average calculation was determined according to the implementation guidance. A coefficient of variation was calculated, based on phosphorus mass monitoring data, to be 0.64. This is the standard deviation divided by the mean of mass data. The facility is able to meet the permit limits based on the WLA so the current CV is used. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies phosphorus monitoring as 3x/wk; if a different monitoring frequency is used, the stated limits should be reevaluated.

The 6-month average and monthly average mass limits of 1.1 and 3.2 lbs/day respectively are recommended during the reissued permit term, rounding to 2 significant figures. The limits are equivalent to the concentrations of 0.19 and 0.57 mg/L respectively at an effluent flow of 0.679 MGD.

The UFWRB TMDL establishes TP wasteload allocations to reduce the loading in the entire watershed including WLAs to meet water quality standards for tributaries to the Upper Fox and Wolf River. Therefore, WLA-based WQBELs are protective of immediate receiving waters and TP WQBELs derived according to s. NR 217.13, Wis. Adm. Code are not required. In this case, the monthly average phosphorus WQBEL of 0.5 mg/L became effective in the current permit as of 04/01/2019. This limit is required to continue during the reissued permit term unless the applicable antibacksliding and limit continuation requirements as described in subch. II of NR 207, and s. NR 205.067(5), Wis. Adm. Codes, are met. An initial review of these requirements show Clintonville WWTF cannot satisfy the limit continuation requirements since phosphorus treatment was implemented at the facility and suspension of this treatment would result in an increased phosphorus concentration where reasonable potential would

likely be demonstrated for the phosphorus WQBEL. **Therefore, the monthly average phosphorus WQBEL of 0.5 mg/L is required to continue during the reissued permit term.**

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

Effluent phosphorus concentration data is shown in the table below from April 2019 – April 2024 since the phosphorus WQBEL became effective in the permit on 04/01/2019. Mass effluent data is calculated using the concentration data and the actual effluent flow that occurred on the same day.

Phosphorus Effluent Data

Statistics	Conc. mg/L	Mass Discharge lbs/day
1-day P ₉₉	0.66	4.0
4-day P ₉₉	0.52	3.1
30-day P ₉₉	0.45	2.5
Mean	0.41	2.3
Std	0.09	0.60
Sample Size	462	462
Data Range	0.12 – 0.69	0.61 – 5.1
Date Range	April 2019 – April 2024	

A review of the mass effluent phosphorus statistics and calculated monthly average and 6-month average mass phosphorus data compared against the TMDL limits show the Clintonville WWTF is currently able to meet those limits. The monthly average limit of 3.2 lbs/day would have never been exceeded and the 6-month average limit of 1.1 lbs/day would have been exceeded once during the current permit term. This 6-month average was 1.3 lbs/day during May 2019 – October 2019 where 6-month averages calculated after this range were below the limit. **Therefore, a compliance schedule and an interim limit are not needed in the permit to meet the TMDL limits.**

TMDL Limits – TSS

Total Suspended Solids (TSS) effluent limits in lbs/day are calculated as recommended in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (April 2020). This WLA found in Appendix I of the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Upper Fox and Wolf Basins (UFW TMDL)* report dated February 2020 are expressed as maximum annual loads (lbs/year). For Clintonville WWTF, these TSS WLAs are 33,878 lbs/yr and 93 lbs/day.

Revisions to chs. NR 106 and 205, Wis. Adm. Code align Wisconsin water quality-based effluent limits with 40 CFR 122.45(d), which requires WPDES permits to contain the following concentration limits, whenever practicable and necessary to protect water quality:

- Weekly average and monthly average limitations for continuous discharges subject to ch. NR 210.
- Daily maximum and monthly average limitations for all other discharges.

Attachment #1

Clintonville WWTF is a municipal facility and is therefore subject to weekly average and monthly average TSS limits derived from TSS annual WLAs.

$$\begin{aligned} \text{TSS Weekly Average Permit Limit} &= \text{Daily WLA} * \text{Weekly multiplier} \\ &= 93 \text{ lbs/day} * 3.38 \\ &= 314 \text{ lbs/day} \end{aligned}$$

$$\begin{aligned} \text{TSS Monthly Average Permit Limit} &= \text{Daily WLA} * \text{Monthly multiplier} \\ &= 93 \text{ lbs/day} * 1.96 \\ &= 182 \text{ lbs/day} \end{aligned}$$

The multipliers used in the weekly average and monthly average calculations were determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 1.14. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies TSS monitoring as 3x/wk; if a different monitoring frequency is used, the stated limits should be reevaluated.

The weekly average and monthly average mass limits of 314 and 182 lbs/day respectively are recommended during the reissued permit term, rounding to 2 significant figures. The limits are equivalent to the concentrations of 55 and 32 mg/L respectively at an effluent flow of 0.679 MGD. **These TMDL-based mass effluent limitations should be included in the permit along with the effective TSS concentration limits in the current permit.**

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

Effluent TSS concentration data is shown in the table below from April 2019 – April 2024 since the phosphorus WQBEL became effective in the permit on 04/01/2019. This is done because the phosphorus treatment is expected to also improve TSS treatment efficiency. Mass effluent data is calculated using the concentration data and the actual effluent flow that occurred on the same day.

TSS Effluent Data

Statistics	Conc. (mg/L)	Mass Discharge (lbs/day)
1-day P ₉₉	24.3	117
4-day P ₉₉	13.2	63.6
30-day P ₉₉	6.8	33.1
Mean	4.2	20.6
Std	5.1	24.6
Sample Size	795	795
Data Range	<0 - 85.8	0 - 316
Date Range	April 2019 – April 2024	

A comparison of both concentration and mass-based effluent TSS P₉₉ statistics with the equivalent concentration and mass-based TSS TMDL limits shows Clintonville WWTF currently can meet those limits. **Therefore, a compliance schedule and an interim limit are not needed in the permit to meet**

the TMDL limits.

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from May 2018 – April 2024.

The table below summarizes the maximum temperatures reported during monitoring from December 2011 – March 2015 along with the calculated limits. The complete thermal table used for the limit calculation is included as attachment #4.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	45	47	75	120
FEB	43	45	91	120
MAR	53	53	66	101
APR	52	55	62	103
MAY	60	62	73	98
JUN	67	68	91	106
JUL	68	69	93	94
AUG	69	70	98	98
SEP	69	78	91	106
OCT	60	64	74	112
NOV	54	54	66	120
DEC	50	54	74	120

Reasonable Potential

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

Attachment #1

- 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 7 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (2022)*.

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ (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 33% 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:

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

Where:

Q_e = annual average flow = 0.679 MGD = 1.05 cfs

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

$$Q_s = \frac{1}{4} \text{ of the } 7\text{-}Q_{10} = 8.4 \text{ cfs} \div 4 = 2.1 \text{ cfs}$$

- 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 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations. Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005. Therefore, only WET testing from June 2005 to present are shown in the table below:

WET Data History

Date Test Initiated	Acute Results LC ₅₀ %				Chronic Results IC ₂₅ %				Footnotes or Comments
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	<i>C. dubia</i>	Fathead Minnow	Pass or Fail?	Use in RP?	
02/07/2006	>100	>100	Pass	Yes	>100	>100	Pass	Yes	
08/26/2008	>100	>100	Pass	No	>100	>100	Pass	No	1
05/16/2012	>100	>100	Pass	Yes				Yes	
10/22/2014	>100	>100	Pass	Yes				Yes	

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.
- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.

$$\text{Acute Reasonable Potential} = [(TU_a \text{ effluent}) (B)(AMZ)]$$

$$\text{Chronic Reasonable Potential} = [(TU_c \text{ effluent}) (B)(IWC)]$$

Attachment #1

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUA and TUC effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC₅₀, IC₂₅ or IC₅₀ ≥ 100%).

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

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

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

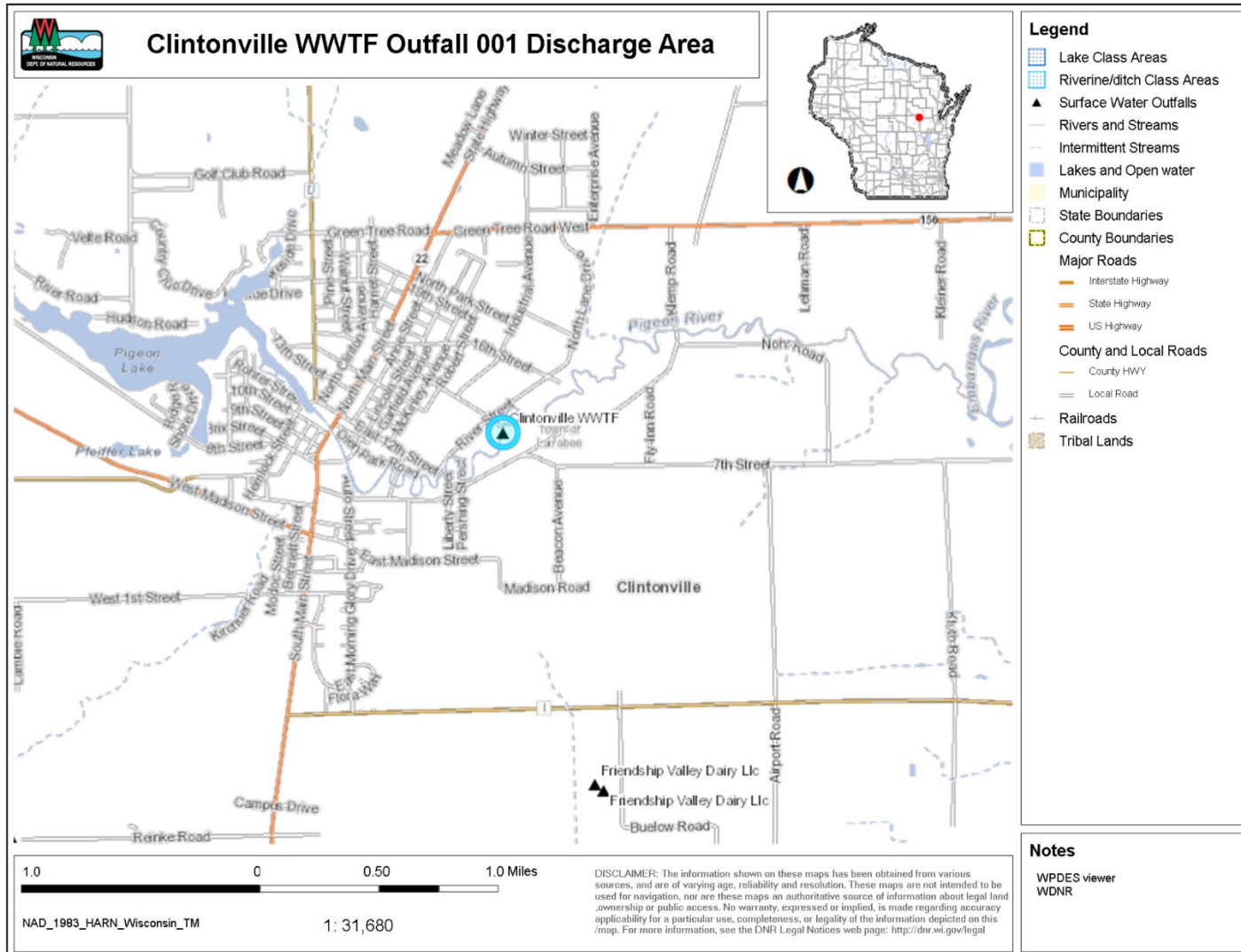
WET Checklist Summary

	Acute	Chronic
AMZ/IWC	Not applicable. 0 Points	IWC = 33%. 0 Points
Historical Data	Three tests used to calculate RP. No tests failed. No acute tests within last 5 years. 5 Points	One test used to calculate RP. No tests failed. No chronic tests within last 5 years. 5 Points
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. 0 Points	Same as acute. 0 Points
Receiving Water Classification	WWTF community. 5 Points	Same as acute. 5 Points
Chemical-Specific Data	No reasonable potential for limits based on ATC; Ammonia nitrogen limit carried over from the current permit. Copper, nickel, zinc, and chloride detected. Additional Compounds of Concern: No. 3 Points	No reasonable potential for limits based on CTC; Ammonia nitrogen limit carried over from the current permit. Copper, nickel, zinc, and chloride detected. Additional Compounds of Concern: No. 3 Points
Additives	No biocides and 1 water quality conditioner added. Permittee has proper P chemical SOPs in place: Yes. 1 Point	All additives used more than once per 4 days. 1 Point
Discharge Category	No industrial contributors. 0 Points	Same as acute. 0 Points
Wastewater Treatment	Secondary or better. 0 Points	Same as acute. 0 Points
Downstream Impacts	No impacts known. 0 Points	Same as acute. 0 Points

Attachment #1

	Acute	Chronic
Total Checklist Points:	14 Points	14 Points
Recommended Monitoring Frequency (from Checklist):	No acute tests recommended.	No chronic tests recommended.
Limit Required?	No.	No.
TRE Recommended? (from Checklist)	No.	No.

- **No WET testing is required because information related to the discharge indicates the potential for effluent toxicity is believed to be low.**



Weekly & Monthly Average Ammonia Nitrogen Limit Calculations – June 2015 Limit Evaluation

	April – June	July – Sept.	Oct.- Dec.	Jan. - March
BACKGROUND INFORMATION:				
7-Q ₁₀ (cfs)	8.4	8.4	8.4	8.4
7-Q ₂ (cfs)	16	16	16	16
Ammonia (mg/L)	0.04	0.03	0.11	0.11
Temperature (degrees F) *	66	69	50	38
Temperature (degrees C)	18.9	20.6	10	3.3
pH (standard units)	8.09	8.08	8.06	7.90
% of river flow used:	100	100	25	25
Reference weekly flow (cfs):	8.4	8.4	2.1	2.1
Reference monthly flow (cfs):	13.6	13.6	3.4	3.4

* - The indicated temperature represents the peak ambient temperature for the months in each group based on Ta values in Table 2 of ch. NR 102.

The next table summarizes the criteria and the associated effluent limitations that are re-calculated for Clintonville.

	April – June	July – Sept.	Oct.- Dec.	Jan. - March
CRITERIA (in mg/L):				
4-day Chronic (@ background pH):				
early life stages present	4.02	3.66		6.99
early life stages absent			7.45	
30-day Chronic (@ background pH)				
early life stages present	1.61	1.46		2.80
early life stages absent			2.98	
EFFLUENT LIMITS (in mg/L):				
Weekly average				
early life stages present	37.96	34.67		21.68
early life stages absent			23.13	
Monthly average				
early life stages present	23.26	21.30		12.08
early life stages absent			12.90	

For warmwater streams burbot are the critical species in the decision of whether ELS present or ELS absent chronic toxicity criteria apply under NR 105, since this species spawns in colder temperatures as early as January. Burbot are known to be present in the Lake Winnebago system, and some of its larger, cooler tributaries, and several were observed during a fishery survey on the Pigeon River immediately below the Clintonville millpond in July 2001. As a result, early life stage present criteria are applied for the months of January through September, while early life stage absent criteria are applied for the months of October through December.

Temperature Limits for Receiving Waters with Unidirectional Flow

(calculation using default ambient temperature data)

Facility:	Clintonville WWTF	7-Q₁₀:	8.4 cfs	Temp Dates		Flow Dates	
Outfall(s):	001	Dilution:	25%	Start:	NA		05/01/18
Date Prepared:	5/16/2024	f:	0	End:	NA		04/30/24
Design Flow (Q_e):	0.679 MGD	Stream type:	Small warm water sport or forage fish				
Storm Sewer Dist.	0 ft	Qs:Q_e ratio:	2.0 :1				
		Calculation Needed?	YES				

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs) (cfs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl) (MGD)	Daily Maximum Flow Rate (Qea) (MGD)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)		(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	8.40	0.828	0.927	0			75	120
FEB	34	50	76	8.40	0.528	0.641	0			91	120
MAR	38	52	77	8.40	1.389	2.161	0			66	101
APR	48	55	79	8.40	1.457	1.768	0			62	103
MAY	58	65	82	8.40	1.180	2.029	0			73	98
JUN	66	76	84	8.40	0.895	1.125	0			91	106
JUL	69	81	85	8.40	1.305	2.455	0			93	94
AUG	67	81	84	8.40	1.097	1.665	0			98	98
SEP	60	73	82	8.40	0.958	1.219	0			91	106
OCT	50	61	80	8.40	1.137	1.261	0			74	112
NOV	40	49	77	8.40	0.730	0.830	0			66	120
DEC	35	49	76	8.40	0.759	1.145	0			74	120