Public Noticed Ho Chunk Nation RV Resort and Campground
Draft Permit Fact Sheet

General Information

Permit Number	WI-0061263-08-0
Permittee Name and Address	Ho Chunk Nation 1230 South Blvd Baraboo WI 53913
Permitted Facility Name and Address	Ho Chunk RV Resort and Campground N. 2884 28th Ave., Lyndon Station, WI
Permit Term	May 01, 2025 to March 31, 2030
Discharge Location	N. 2884 28th Ave., Lyndon Station, WI T15N, R5E, Section 25, Town of Kildare, Juneau County, WI
Receiving Water	Wisconsin River in Lower Lemonweir River Watershed of Lower Wisconsin River Basin in Juneau county
Stream Flow ($Q_{7,10}$)	1790 cfs
Stream Classification	Warmwater sportfish, non-public water supply
Discharge Type	Seasonal (April – November)
Annual Average Design Flow (MGD)	0.045 MGD
Industrial or Commercial Contributors	None
Plant Classification	A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; D - Disinfection; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

Ho-Chunk Nation owns and operates Ho-Chunk RV Resort and Campground (formerly Crockett's Resort) for seasonal treatment and discharge (April – November) of domestic wastewaters. The annual average design flow of the facility is 0.045 million gallons per day (MGD). The facility did not discharge effluent to surface water during the last permit term except to provide monitoring data in the summer of 2024 so the DNR could generate the water quality effluent limitations memo (WQBEL) for the next permit term; all other wastewater during this

permit term was hauled to the Ho-Chunk Village WWTF in Baraboo for treatment and disposal. Treatment of wastewater is achieved using an influent equalization basin, followed by two sequencing batch reactors (SBRs). Effluent is disinfected via chlorination (followed by dechlorination by addition of sodium bisulfite) prior to seasonal discharge to the Wisconsin River. When needed, sludge is hauled to the Ho-Chunk Nation WWTF plant in Baraboo. No significant operational changes occurred in the last permit term or are proposed for the upcoming term. Proposed permit changes are as follows: 1) new effluent zinc limits, 2) effluent fecal coliform monitoring and limits are replaced with *Escherechia coli* (E. coli) monitoring and limits. and 3) PFAS sludge 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 to quantitate risk.

Substantial Compliance Determination.

Enforcement During Last Permit: None. There has been no discharge from the facility since the end of the 2015 camping season (fall 2015), except to provide monitoring data in the summer of 2024 so the DNR could generate the WQBEL for the next permit term.

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on 4/11/2024, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Tanner Conners on 4/11/2024.

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	No flow monitoring	Representative influent samples shall be collected prior to the treatment unit at the influent tank.
001	0.005 MGD (June-Oct 2024), and only to provide monitoring data for the permit application	Representative effluent samples (except for E. coli and chlorine) shall be collected at the chlorine contact tank PRIOR to disinfection. Representative effluent samples for E. coli and chlorine shall be collected at the chlorine contact tank AFTER disinfection.
002	No sludge hauled during the last permit term	As long as sludge is hauled for disposal, representative sludge samples shall be collected once per year and monitored for List 1. Sludge samples shall be collected prior to hauling and test results shall be reported on Form 3400-49 "Waste Characteristics Report". Hauled sludge reports shall be submitted on Form 3400-52 "Other Methods of Disposal or Distribution Report" following each year that sludge is hauled.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- PRIOR to TREATMENT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total		mg/L	2/Week	Grab	
BOD5, Total		mg/L	2/Week	Grab	

1.1.1 Changes from Previous Permit:

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

1.1.2 Explanation of Limits and Monitoring Requirements

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

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 001- EFFLUENT to WI RIVER

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Calculated	
BOD5, Total	Monthly Avg	30 mg/L	2/Week	Grab	
BOD5, Total	Weekly Avg	45 mg/L	2/Week	Grab	
Suspended Solids, Total	Monthly Avg	30 mg/L	2/Week	Grab	
Suspended Solids, Total	Weekly Avg	45 mg/L	2/Week	Grab	
pH Field	Daily Max	9.0 su	2/Week	Grab	
pH Field	Daily Min	6.0 su	2/Week	Grab	
Copper, Total Recoverable	Daily Max	27 ug/L	Monthly	Grab	
Copper, Total Recoverable	Daily Max	0.01 lbs/day	Monthly	Calculated	
Zinc, Total Recoverable	Daily Max	217 ug/L	Monthly	Grab	
Zinc, Total Recoverable	Daily Max	0.18 lbs/day	Monthly	Calculated	
Phosphorus, Total		mg/L	Weekly	Grab	
Phosphorus, Total		lbs/day	Weekly	Calculated	
Phosphorus, Total		lbs/month	Monthly	Calculated	
Phosphorus, Total	Annual Total	26 lbs/yr	Monthly	Calculated	See TMDL footnote.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total		mg/L	Annual	Grab	
Nitrogen, Nitrite + Nitrate Total		mg/L	Annual	Grab	
Nitrogen, Total Kjeldahl		mg/L	Annual	Grab	
Nitrogen, Total		mg/L	Annual	Calculated	Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit Effective May-September annually.
E. coli	% Exceedance	10 Percent	Weekly	Grab	Limit Effective May - September annually. See the E. coli Percent Limit section below. Enter the result in the DMR on the last day of the month.
Chlorine, Total Residual	Daily Max	38 ug/L	Weekly	Grab	Limit Effective May-September annually.

2.1.1 Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit includes 1) the addition of zinc limits, and 2) 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.

2.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated October 21, 2024, titled “Water Quality-Based Effluent Limitations for the Ho Chunk RV Resort and Campground Wastewater Treatment Facility” from Benjamin Hartenbower to Angela Parkhurst.

Monitoring Frequencies- The Monitoring Frequencies for Individual Wastewater Permits guidance (April 12, 2021) recommends that standard monitoring frequencies be included in individual wastewater permits based on the size and type of the facility, in order to characterize effluent quality and variability, to detect events of noncompliance, and to ensure consistency in permits issued across the state. Guidance and requirements in administrative code were considered when determining the appropriate monitoring frequencies for pollutants that have final effluent limits in effect during this permit term. No changes have been made.

Phosphorus: Phosphorus requirements are based on the Phosphorus Rules that became effective December 1, 2010 as detailed in chs. NR 102, Water Quality Standards and NR 217, Effluent Standards and Limitations for Phosphorus, Wis. Adm. Code. Chapter NR 217, Wis. Adm. Code, addresses point source dischargers of phosphorus to surface waters.

Discharge effluent concentration (mg/L) shall be reported two times per week upon permit reissuance and will be used to calculate amounts reported for mass-based parameters. An additional reporting requirement for lbs/month will be used to calculate the facility's annual total discharge, which can be compared directly to the facility's designated WLA. Final TMDL WLA-based effluent limit of 26 lbs/yr as an annual total is effective at permit reissuance.

Wisconsin River Total Maximum Daily Load (TMDL): Ho Chunk RV Resort is located within the Wisconsin River Basin Total Maximum Daily Load (TMDL), which was approved by EPA April 26, 2019. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amounts of phosphorus 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 WLA in the TMDL, which is 26 lbs/year for Ho Chunk RV Resort's WLA.

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	B	Liquid	N/A	N/A	Hauled	None
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? No						
Is a priority pollutant scan required? No						

3.1 Sample Point Number: 002- HAULED SLUDGE

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

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	
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.

3.1.1 Changes from Previous Permit:

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

3.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector

attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n).

PFAS- The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS."
Collecting sludge data on PFAS concentrations from a wide range of wastewater treatment facilities will help protect public health from exposure to elevated levels of PFAS and determine the department's implementation of EPA's recommendations. To quantitate this risk, PFAS sampling has been included in this WPDES permit pursuant to ss. NR 214.18(5)(b) and NR 204.06(2)(b)9., Wis. Adm. Code.

4 Schedules

None

Other Comments

Facility requested the re-activation of the surface water outfall for potential future operational changes. If surface water discharge resumes, the facility must comply with all monitoring and limitations stated for Sample Point 001 upon discharge.

Attachments

Water Quality Based Effluent Limits - WQBEL memo dated October 21, 2024, titled "Water Quality-Based Effluent Limitations for the Ho Chunk RV Resort and Campground Wastewater Treatment Facility" from Benjamin Hartenbower to Angela Parkhurst.

Public Notice - Juneau County Star-Times, PO Box 220, Mauston, WI 53948-0220 and Wisconsin Dells Events, 716 Elm St., Wisconsin Dells, WI 53965-1520

Justification Of Any Waivers From Permit Application Requirements

N/A

Prepared By: Angela Parkhurst Wastewater Specialist Date: March 5, 2025

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: October 21, 2024

TO: Angela Parkhurst – WCR/Eau Claire

FROM: Benjamin Hartenbower – WCR/Eau Claire

SUBJECT: Water Quality-Based Effluent Limitations for the Ho Chunk RV Resort and Compground Wastewater Treatment Facility
WPDES Permit No. WI-0061263

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 Ho Chunk RV Resort and Compground Wastewater Treatment Facility in Juneau County. This municipal wastewater treatment facility (WWTF) discharges to the Wisconsin River, located in the Lower Lemonweir River Watershed in the Lower Wisconsin River Basin. This discharge is included in the Wisconsin River TMDL as approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 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	Annual Total	Footnotes
Flow Rate						1,2
BOD_5			45 mg/L	30 mg/L		1
TSS			45 mg/L	30 mg/L		1
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen						2
E. Coli				126 #/100 mL geometric mean		3
Chlorine	38 µg/L					1
Copper	27 µg/L, 0.01 lbs/day					1
Zinc	217 µg/L, 0.18 lbs/day					
Phosphorus TMDL Limit					9 lbs/year	4
TKN, Nitrate+Nitrite, and Total Nitrogen						5

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. Bacteria limits apply during the disinfection season of May - September. Additional limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
4. The phosphorus mass limit is based on the Total Maximum Daily Load (TMDL) for the Wisconsin River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA on April 26, 2019 with site-specific criteria approved by EPA on July 9, 2020.

5. 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).

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 Benjamin Hartenbower at (715) 225-4705 or Benjamin.Hartenbower@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (2) – Narrative & Map

PREPARED BY: _____ Date: _____

Benjamin Hartenbower, PE,
Water Resources Engineer

E-cc:

Tanner Connors,Wastewater Engineer – SCR/Fitchburg
Geisa Thielen, Regional Wastewater Supervisor – WCR/Eau Claire
Diane Figiel, Water Resources Engineer – WY/3
Kurt Rasmussen, Water Quality Biologist – WCR/La Crosse
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
the Ho Chunk RV Resort and Compground Wastewater Treatment Facility
WPDES Permit No. WI-0061263

Prepared by: Benjamin P. Hartenbower

PART 1 – BACKGROUND INFORMATION

Facility Description:
The Facility consists of an influent equalization basin, two SBR tanks, a chlorine contact chamber and an aerobic digester.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations
The current permit, expiring on December 31, 2024, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Annual Total	Footnotes
Flow Rate						1,2
BOD_5			45 mg/L	30 mg/L		1
TSS			45 mg/L	30 mg/L		1
pH	9.0 s.u.	6.0 s.u.				1
Ammonia Nitrogen						2
Fecal Coliform May - September				400 #/100 mL geometric mean		
Chlorine	38 µg/L					
Copper	27 µg/L, 0.01 lbs/day					
Zinc						2
Phosphorus					26 lbs/year	3
TKN, Nitrate+Nitrite, and Total Nitrogen						2

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. Monitoring only.
3. Wisconsin River TMDL limit.

Receiving Water Information

- Name: Wisconsin River
- Waterbody Identification Code (WBIC): 1179900
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: USGS for Station 05404800, Wisconsin River near Wisconsin Dells.

  $7\text{-}Q_{10}$ = 1870 cfs
  $7\text{-}Q_{2}$ = 2750 cfs

  Harmonic Mean Flow = 8090 cfs
- Hardness = 45 mg/L as $CaCO_3$. This value represents the geometric mean of 176 samples collected in the Wisconsin River from 10/26/1994 to 01/25/2001.
- % 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: Chloride and metals data are from the Wisconsin River. 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. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: There are several other dischargers to the Wisconsin River, however 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: This discharge is located within the WI River TMDL for phosphorus.

Effluent Information:

- Design Flow Rates(s):

  Maximum Annual Average (Excluding zero flow days) = 0.045 MGD (Million Gallons per Day)
  Peak daily = 0.098 MGD (estimated)

  For reference, the actual average flow from June 2024 to August 2024 during discharge occurences was 0.005 MGD.
- Hardness = 89 mg/L as $CaCO_3$. This value represents the geometric mean of 37 effluent samples collected from 07/27/2004 to 08/30/2024.
- 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 from the Ho-chunk RV Resort and Campground.
- Additives: Chlorine
- Total Phosphorus Wasteload Allocation: 9 lbs/year
- Effluent characterization: This facility is categorized as a minor municipality, so the permit application required effluent sample analyses for a limited number of common pollutants, as specified in s. NR 200.065, Table 1, Wis. Adm. Code, primarily metal substances plus Chloride and Hardness. The permit-required monitoring for Ammonia Nitrogen, Chlorine, Copper, Zinc, and Phosphorus from June 2024 to August 2024 is used in this evaluation.

Attachment #1

Chemical Specific Effluent Data at Outfall 001

Sample Date	Copper µg/L	Sample Date	Zinc µg/L	Sample Date	Chloride mg/L
06/11/2024	10.4	06/21/2024	114	07/22/2024	78
06/17/2024	6.5	07/22/2024	82.1	07/26/2024	80
06/21/2024	20.7			07/31/2024	98
07/01/2024	11.5			08/06/2024	110
07/03/2024	11.5			08/08/2024	110
07/05/2024	9.1				
07/08/2024	8.7				
07/12/2024	7.8				
07/17/2024	11.7				
07/22/2024	28.8				
07/26/2024	7.8				
08/06/2024	16.5				
08/08/2024	13.9				
08/16/2024	15.8				
08/30/2024	19.4				
1-day P_{99}	33.22	mean	98.05	mean	95
4-day P_{99}	21.90				

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

The following table presents the average concentrations and loadings at Outfall 001 from June 2024 to August 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6):

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	7.4 mg/L	
TSS	2.1 mg/L*	
pH	7.30 s.u.	
Fecal Coliform	135#/100 mL	
Copper	13.34 µg/L	0.00048 lbs/day
Phosphorus		0.26 lbs/day

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

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

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

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

Acute Limits based on 1-Q_{10}

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

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for the Ho Chunk RV Resort and Compground Wastewater Treatment Facility and the limits are set based on two times the acute toxicity criteria.

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 = 1496 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Chlorine		19.03		38.06	7.61	<100		
Arsenic		340	0.802	680	136	<7.7		
Cadmium	89	9.0	0.026	18.0	3.6	<0.41		
Chromium (+3)	89	1637	0.450	3274	655	<1.1		
Copper	89	13.9	1.050	27.8			33.2	28.8
Lead	89	95	0.586	191	38	<1.4		
Nickel	89	425	1.191	849	170	1.9		
Zinc	89	109	2.233	217	43	98.05		114
Chloride		757	12.6	1514	303	95		110

* * The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} 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 = 468 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}
Chlorine		7.28		48888.90	9777.78	<100	
Arsenic		152	0.802	1016715	203343	<7.7	
Cadmium	46	1.3	0.026	8823.5	1764.7	<0.41	
Chromium (+3)	46	70	0.450	467151	93430	<1.1	
Copper	46	5.3	1.050	28751.3			21.9
Lead	46	13	0.586	84983	16997	<1.4	
Nickel	46	27	1.191	173909	34782	1.9	
Zinc	46	61	2.233	395373	79075	98.05	
Chloride		395	12.6	2568339	513668	95	

Monthly Average Limits based on Wildlife Criteria (WC)
The effluent characterization did not include any effluent sampling results for substances for which Wildlife Criteria exist.

Monthly Average Limits based on Human Threshold Criteria (HTC)
RECEIVING WATER FLOW = 2023 cfs (¼ of the Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MAX. EFFL. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370.0	0.026	10747510.6	2149502.1	<0.41	
Chromium (+3)	3818000	0.450	110910321032	22182064206	<1.1	
Lead	140	0.586	4049870	809974	<1.4	
Nickel	43000	1.191	1249086495	249817299	1.9	

Monthly Average Limits based on Human Cancer Criteria (HCC)
RECEIVING WATER FLOW = 2023 cfs (¼ of the Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Arsenic	13.3	0.802	363059.3	72611.9	<7.7	

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

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

Total Residual Chlorine – Because chlorine is added as a disinfectant, effluent limitations are recommended to assure proper operation of the de-chlorination system. Section NR 210.06(2)(b), Wis. Adm. Code, states, "When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L." Because the WQBELs are more restrictive, they are recommended instead. Specifically, a daily maximum limit of 38 µg/L (38.06, rounded to two significant figures) is required.

Copper – Considering available effluent data from the current permit term (June 2024 to August 2024), the 30-day P_{99} concentration is 16.1 µg/L, the 4-day P_{99} concentration is 21.9 µg/L, and the 1-day P_{99} concentration is 33.2 µg/L, with a maximum concentration of 28.8 µg/L. The maximum effluent concentration and the 1-day P_{99} of the effluent data exceed the calculated daily maximum limit, therefore concentration and mass limits, as well as monthly monitoring, are required. **Current limits and monitoring for copper are recommended to continue.**

Zinc – Considering available effluent data from the current permit term (June 2024 to August 2024), the mean effluent concentration is 92.73 µg/L. This value exceeds 1/5 of the calculated daily limit, **therefore concentration and mass limits, as well as monthly monitoring, are required.**

The acute mass limitation of 0.18 lbs/day is based on the concentration limit and the peak daily flow rate of 0.098 MGD (217 µg/L * 0.098 MGD * 8.34/1000) in accordance with s. NR 106.07(2)(a), Wis. Adm. Code.

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

Mercury – The permit application did not require monitoring for mercury because the Ho Chunk RV Resort and Compground Wastewater Treatment Facility is categorized as a minor facility as defined in s. NR 200.02(8), Wis. Adm. Code. In accordance with s. NR 106.145(3)(a)3., Wis. Adm. Code, a minor municipal discharger shall monitor, and report results of influent and effluent mercury monitoring once every three months if, there are two or more exceedances in the last five years of the high-quality sludge mercury concentration of 17 mg/kg specified in s. NR 204.07(5). However, since the Ho Chunk RV Resort and Compground Wastewater Treatment Facility is a system that generates solids which are hauled away, and sludge sampling is not available. It is not expected that there are exceedances of the high-quality mercury concentration based on similar municipal treatment plants and the lack of industries. **No monitoring is recommended.**

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

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. Given the fact that the Ho Chunk RV Resort and Compground Wastewater Treatment Facility does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

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

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

Where:

A = 0.411 and B = 58.4 for a Warm Water Sport fishery, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 27 sample results were reported from June 2024 to August 2024. The maximum reported value was 7.87 s.u. (Standard pH Units). The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 7.93 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 7.91 s.u. Therefore, a value of 7.93 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 7.93 s.u. into the equation above yields an ATC = 9.58 mg/L.

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

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

Daily Maximum Ammonia Nitrogen Determination

	Ammonia Nitrogen Limit mg/L
2×ATC	19.17
1-Q_{10}	204446

The 2×ATC method yields the most stringent limits for the Ho Chunk RV Resort and Compground Wastewater Treatment Facility.

Presented below is a table of daily maximum limitations corresponding to various effluent pH values. Use of this table is not necessarily recommended in the permit, but it is presented herein for informational purposes.

Daily Maximum Ammonia Nitrogen Limits – WWSF

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

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

Weekly average and monthly average limits for ammonia nitrogen are based on chronic toxicity criteria in ch. NR 105, Wis. Adm. Code.

The 30-day chronic toxicity criterion (CTC) for ammonia in waters classified as Warm Water Sport Fish Community is calculated by the following equation, according to subchapter IV of NR 106, Wis. Adm. Code.

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

Where:

pH = the pH (s.u.) of the receiving water,
E = 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-Q3, if available) to derive weekly average limitations. And the 30-day criteria are used with the 30-Q_5 (estimated as 85% of the 7-Q_2 if the 30-Q_5 is not available) to derive monthly average limitations. The stream flow value is further adjusted to temperature; 100% of the flow is used if the Temperature ≥ 16 ºC, 25% of the flow is used if the Temperature < 11 ºC, and 50% of the flow is used if the Temperature ≥ 11 ºC but < 16 ºC.

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

Weekly and Monthly Ammonia Nitrogen Limits – WWSF

		April & May	June-September	October-March
Effluent Flow	Qe (MGD)	0.045	0.045	0.045
Background Information	7-Q_{10} (cfs)	1870	1870	1870
	7-Q_2 (cfs)	2750	2750	2750
	Ammonia (mg/L)	0.07	0.07	0.14
	Temperature (°C)	16.1	23.9	11.7
	pH (s.u.)	7.66	7.74	7.51
	% of Flow used	50	100	25
	Reference Weekly Flow (cfs)	935	1870	468
	Reference Monthly Flow (cfs)	1169	2338	584

Attachment #1

		April & May	June-September	October-March
Criteria mg/L	4-day Chronic			
	Early Life Stages Present	8.45	4.69	10.85
	Early Life Stages Absent	8.45	4.69	13.04
	30-day Chronic			
	Early Life Stages Present	3.38	1.87	4.34
	Early Life Stages Absent	3.38	1.87	5.22
Effluent Limitations mg/L	Weekly Average			
	Early Life Stages Present	112488	123989	
	Early Life Stages Absent			86675
	Monthly Average			
	Early Life Stages Present	55538	60584	
	Early Life Stages Absent			42656

Effluent Data
One sample for ammonia nitrogen was taken, and the result was as follows:

Ammonia Nitrogen Effluent Data

	Ammonia Nitrogen mg/L
06/21/2024	1.8

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

Conclusions and Recommendations
No limits are needed however monthly monitoring is recommended when discharging.

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

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

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

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because the Ho Chunk RV Resort and Compground Wastewater Treatment Facility 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 through September. No changes are recommended to the required disinfection season.

Effluent Data
The Ho Chunk RV Resort and Compground Wastewater Treatment Facility has monitored effluent *E. coli* from July 2024 to August 2024 and a total of 9 results are available. A geometric mean of 126 counts/100 mL was never exceeded, with a maximum monthly geometric mean of 8 counts/100 mL. Effluent data exceeded 410 counts/100 mL one time (which is 11% of the total sample results). The maximum reported value was 730 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

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

Annual Average Mass Total Phosphorus Loading

Month	Monthly Avg. mg/L	Total Flow MG/month	Total Phosphorus lb./mo.
Jun 2024	5.25	0.03	1.39
Jul 2024	6.02	0.07	3.43
Aug 2024	15.00	0.03	3.62
		Average =	**2.81**

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

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 (*May 2020). The wasteload allocations (WLA) that implement site-specific criteria for Lakes Petenwell,

Castle Rock, and Wisconsin are found in Appendix K of the *Total Maximum Daily Loads for Total Phosphorus in the Wisconsin River Basin (WRB TMDL)* report dated April 26, 2019 and are expressed as maximum annual loads (lbs/year) and maximum daily loads (lbs/day). The WLA that implement statewide criteria found in Appendix J of the TMDL report are no longer applicable following approval of these site-specific criteria. The daily WLAs in the WRB TMDL equals the annual WLA divided by the number of days in the year. Therefore, the daily WLA is an annual average.

Total Phosphorus Wasteload Allocation: 9 lbs/year (see Appendix K of the TMDL document)

Because this discharge is not routine or predictable, the TMDL limits are best expressed as a total annual discharge limit. This limit should be set equal to the wasteload allocation of **9 lbs/year.**

Conclusions:
In summary, the following limits are recommended by this evaluation:

- Annual Total Phosphorus mass limit of 9 lbs/year

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

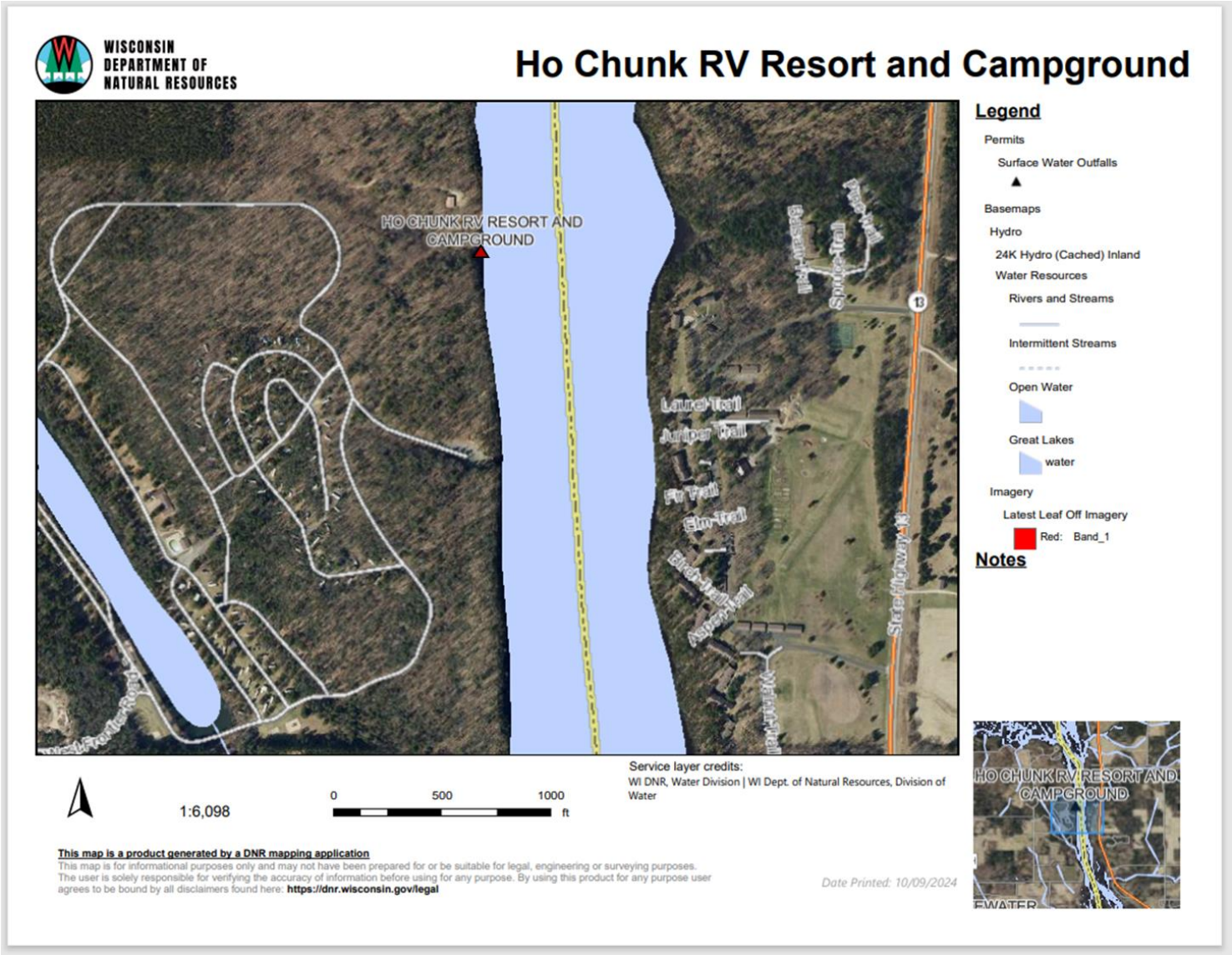
Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum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

Due to the amount of upstream flow available for dilution in the limit calculation (Qs:Qe >20:1), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code). For biological treatment systems of domestic waste, there is no reasonable potential for the discharge to exceed this limit. **Therefore, no temperature limits or monitoring are recommended.**

PART 7 – WHOLE EFFLUENT TOXICITY (WET)

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

- Chronic testing is usually not recommended where the ratio of the 7-Q_{10} to the effluent flow exceeds 100:1 and acute testing is not typically recommended if the ratio exceeds 1000:1. For Ho Chunk RV Resort and Compground, that ratio is approximately 26858:1. With this amount of dilution, there is believed to be little potential for acute or chronic toxicity effects in the Wisconsin River associated with the discharge from the Ho Chunk RV Resort and Compground WWTF, so the need for acute and chronic WET testing will not be considered further.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24K Hydro (Cached) Inland
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water
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HO CHUNK RV RESORT AND CAMPGROUND