Permit Fact Sheet

General Information

Permit Number	WI-0060798-11-0
Permittee Name and Address	VILLAGE OF RADISSON P O Box 127, Radisson, WI 54867
Permitted Facility Name and Address	Village of Radisson 3502N WISCONSIN AVENUE, RADISSON, WISCONSIN
Permit Term	August 01, 2026 to June 30, 2031
Discharge Location	3502N Wisconsin Avenue, Radisson, Wisconsin (SW¼ NW¼ of Section 23; T38N-R7W)
Receiving Water	Unnamed Wetland Complex in the Couderay River Watershed of Upper Chippewa River Basin in Sawyer County
Stream Flow ($Q_{7,10}$)	0 cfs
Stream Classification	Limited Aquatic Life (LAL) community, non-public water supply, recreational use and within the ceded territory
Wild Rice Impacts *(no specific wild rice standards exist at this time)*	No impacts identified. The conclusion of no impacts is based on no wild rice waters inventoried near the outfall. (Evaluation completed March 2017)
Discharge Type	Existing continuous discharger
Annual Average Design Flow (MGD)	0.05 MGD
Industrial or Commercial Contributors	No
Plant Classification	A3 - Recirculating Media Filters; SS - Sanitary Sewage Collection System
Approved Pretreatment Program?	N/A

Facility Description

The Village of Radisson owns and operates a domestic wastewater facility to treat waste generated from homes and businesses in the community. The plant designed to treat 50,250 gallons per day currently treats an average of 42,000 gallons per day (2021-2025 data). Wastewater (influent) generated from households flows through a fine screen into a 100,000-gallon septic/settling tank where floating and suspended solids are allowed to separate from the liquid waste and settle (primary treatment). Wastewater then travels to a dosing tank where water is mixed with treated and partially treated wastewater. The ratio of effluent mixed and the number of times water passes through the system are controlled to provide ample treatment. Wastewater is pumped from the dosing tank to a series of filter beds constructed of layers of fine and coarse gravel (secondary treatment). Naturally occurring aerobic microorganisms growing on the sand particles metabolize the organic matter in the wastewater as it seeps through the filter. Water from the filter beds flows to a splitter box where part is “recirculated” back to the dosing tank and filter beds. The rest is discharged to an unnamed wetland in Sawyer County. The solids from the settling tank are pumped regularly to prevent the discharge of accumulated solids to the sand filters. These solids are considered septage and are regulated under NR 113, Wisconsin Administrative Code, for septage disposal.

Substantial Compliance Determination

All conditions and standard requirements of the current permit are being met. After a desk top review of all discharge monitoring reports and CMARs, and a site visit on August 28, 2024, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Arthur Ryzak, WDNR on April 15, 2026**.**

Sample Point Descriptions

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
701	INFLUENT An average of 0.042 MGD (2021-2025 data)	Representative influent samples shall be collected as the influent enters the treatment system.
003	EFFLUENT An average of 0.032 MGD (2021-2025 data)	Representative effluent samples shall be collected after the last treatment unit prior to discharge to the unnamed wetland.
990	SEPTAGE Flow is not a required parameter	All septic tank solids shall be managed in compliance with Chapter NR 113, Wisconsin Administrative Code, regarding Servicing Septic or Holding Tanks.

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	2/Week	24-Hr Flow Prop Comp	

Changes from Previous Permit:

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

Flow - The sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes.

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: 003- EFFLUENT TO SURFACE WATER

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Monthly Avg	20 mg/L	2/Week	24-Hr Flow Prop Comp	
BOD5, Total	Weekly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	20 mg/L	2/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	30 mg/L	2/Week	24-Hr Flow Prop Comp	
Dissolved Oxygen	Daily Min	4.0 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	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Monitoring and limit effective May through September per the Effluent Limitations for E. coli Schedule.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Monitoring and limit effective May through September per the Effluent Limitations for E. coli Schedule. See the E. coli Percent Limit permit section. Enter the result in the DMR on the last day of the month.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	18 mg/L	2/Week	24-Hr Flow Prop Comp	Limit is effective May through October.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	50 mg/L	2/Week	24-Hr Flow Prop Comp	Limit is effective November through April.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	45 mg/L	2/Week	24-Hr Flow Prop Comp	Limit is effective May through October.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	83 mg/L	2/Week	24-Hr Flow Prop Comp	Limit is effective November through April.
Nitrogen, Ammonia (NH3-N) Total	Daily Max - Variable	mg/L	2/Week	24-Hr Flow Prop Comp	Enter the daily ammonia result on the eDMR and compare it to the Nitrogen, Ammonia Variable Limit column to determine compliance.
Nitrogen, Ammonia Variable Limit		mg/L	2/Week	See Table	Using the daily pH result look up the applicable ammonia limit using the table in the Ammonia Limitation permit section and report the variable limit on the eDMR.
Phosphorus, Total		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring is required during the 2029 calendar year.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	See the Nitrogen Series Monitoring permit section for testing schedule.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	See the Nitrogen Series Monitoring permit section for testing schedule.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Total Nitrogen = Total Nitrogen Kjeldahl (mg/L) + Nitrite + Nitrate Nitrogen (mg/L). See the Nitrogen Series Monitoring permit section for testing schedule.

Changes from Previous Permit

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

- **Flow-** The sample frequency for flow has been changed from "continuous" to "daily" for eDMR reporting purposes.
- **E. coli-** Escherichia coli (E. coli) monitoring and limits will begin at the end of the Effluent Limitations for E. coli Schedule.

- **Total Ammonia Nitrogen** – To protect water quality monthly average, weekly average and variable daily maximum limits are needed to protect water quality.
- **Monitoring Frequency** – The frequency for BOD5, total suspended solids, dissolved oxygen and pH have increased to meet minimum monitoring frequencies identified in the guidance described below.

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 January 12, 2026.

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. The frequency for pH has increased to twice a week, which is below the minimum standard outlined. Based on data submitted during the previous permit term shows consistent compliance with permit limitations, and the monitoring frequency is consistent with requirements of state code. If performance levels begin to vary during the permitted term, the department may re-evaluate current sampling frequencies and implement more frequent monitoring via permit modification or at permit reissuance.

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

3 Septage Management - Monitoring and Limitations

Septage management is required in accordance ch. NR 113, Wisconsin Administrative Code. Records must be kept and made available to the Department on request. Required record keeping includes volumes of septage pumped, dates when the septage was removed, land application site DNR number and method used to satisfy pathogen and vector control, and/or the treatment plant where septage is disposed. Annual reporting is required when the permittee land applies the septage. Annual reporting is also required when the permittee disposes of septage at a designated treatment facility.

3.1 Sample Point Number: 990- SEPTAGE

Changes from Previous Permit:

No changes from the previous permit.

Explanation of Limits and Monitoring Requirements

Requirements for septage management are determined in accordance with ch. NR 113, Wis. Adm. Code.

4 Schedules

4.1 Disinfection and Effluent Limitations for E. coli

Required Action	Due Date
Progress Report: The permittee shall submit a progress report on development and submittal of a facility plan for upgrades to meet disinfection requirements and E. coli limits.	03/31/2027

Submit Facility Plan: The permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code for meeting disinfection requirements and complying with E. coli surface water limitations. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.	01/31/2028
Final Plans and Specifications: The permittee shall submit final construction plans to the Department for approval pursuant to ch. NR 108, Wis. Adm. Code, specifying treatment plant upgrades that must be constructed to meet disinfection requirements per s. NR 210.06(1), Wis. Adm Code, achieve compliance with final E. coli limitations, and a schedule for completing construction of the upgrades by the complete construction date specified below.	01/31/2029
Treatment Plant Upgrade to Meet Limitations: The permittee shall initiate bidding, procurement, and/or construction of the project. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats., prior to initiating activities defined as construction under ch. NR 108, Wis. Adm. Code. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications.	07/31/2029
Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades.	07/31/2030
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	01/31/2031
Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations.	04/30/2031

Explanation of Schedule

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

Attachments

Water Flow Schematic updated October 2020

Water Quality Based Effluent Limits memo dated January 12, 2026

Justification Of Any Waivers From Permit Application Requirements

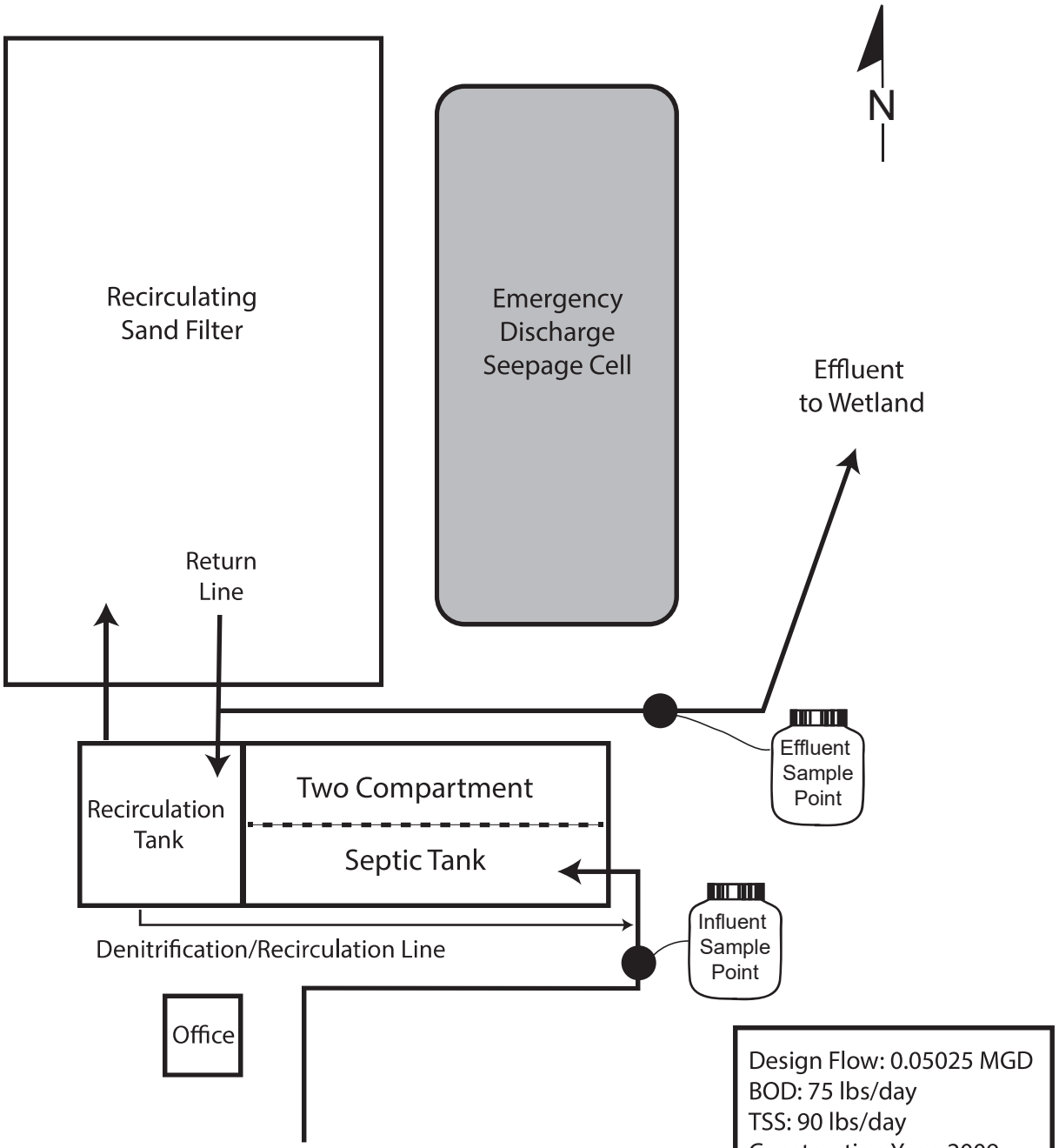
A decision has been made not to require effluent monitoring for metals in the application because:

1. The low design flow (0.05 MGD) and low actual flows (an average of 0.047 MGD) from this facility.
2. The wastewater is all domestic with no industrial contributors to the collection system.
3. Based on the total points accumulated on the WET checklist and Chapter 1.3 of the WET Guidance Document there is little likelihood the effluent is toxic.

Prepared By: Sheri A. Snowbank Wastewater Specialist **Date:** April 17, 2026

Village of Radisson
Wastewater Treatment Facility

The Radisson wastewater treatment facility consists of 100,000 gallon underground settling tank divided into two compartments. The effluent is directed to the dosing tank and then to a series of recirculating sand filters. The treated effluent discharges to an unnamed wetland. One of the seepage cells has been retained in case of emergency discharges. Biosolids from the settling tank will be regulated as septage. The diagram below shows the treatment units.



NOT TO SCALE

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: January 12, 2026

TO: Sheri Snowbank – NOR/Spooner Service Center

FROM: Michael Polkinghorn – NOR/Rhinelander Service Center Michael Polkinghorn

SUBJECT: Water Quality-Based Effluent Limitations for the Village of Radisson
WPDES Permit No. WI-0060798-11-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable) for the discharge from the Village of Radisson in Sawyer County. This municipal wastewater treatment facility (WWTF) discharges to an unnamed wetland, located in the Couderay River Watershed in the Upper Chippewa River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 003:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1
BOD_5			30 mg/L	20 mg/L	1, 2
TSS			30 mg/L	20 mg/L	1, 2
pH	9.0 s.u.	6.0 s.u.			1, 2
Dissolved Oxygen		4.0 mg/L			1, 2
E. coli May – September				126 #/100 mL geometric mean	3
Ammonia Nitrogen					4, 5
Single	3.8 mg/L		**3.8 mg/L**	**3.8 mg/L**	
Variable May – October November – April	 Variable Variable		 **45 mg/L** **83 mg/L**	 **18 mg/L** **50 mg/L**	
Phosphorus					1, 6
TKN, Nitrate+Nitrite, and Total Nitrogen					1, 7

Footnotes:

1. No changes from the current permit.
2. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL. The permit will include a compliance schedule to meet these limits.
4. 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 of 3.8 mg/L. The Village of Radisson shall notify the Department if the single limit or the variable limits based on effluent pH are preferred.

Daily Maximum Ammonia Nitrogen Limits – LAL Community

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

6. Monthly monitoring for 1 year is recommended to continue during the reissued permit term to determine the need for a technology-based limit at the next permit reissuance.
7. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).

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 (2) – Narrative & discharge area map.

PREPARED BY: Michael A. Polkinghorn – Water Resources Engineer

E-cc: Arthur Ryzak, Regional Wastewater Engineer – NOR/Ladysmith Service Center
Michelle BalkLudwig, Regional Wastewater Supervisor – NOR/Spooner Service Center
Diane Figiel, Water Resources Engineer – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

Water Quality-Based Effluent Limitations for
Village of Radisson

WPDES Permit No. WI-0060798-11-0

Prepared by: Michael A. Polkinghorn

PART 1 – BACKGROUND INFORMATION

Facility Description

The Village of Radisson owns and operates a domestic wastewater facility to treat waste generated from homes and businesses in the community. Wastewater (influent) generated from households flow through a fine screen unit into a 100,000-gallon septic or settling tank where floating and suspended solids are allowed to separate from the liquid waste and settle (primary treatment). Wastewater then travels to a dosing tank where water is mixed with treated (effluent) and partially treated wastewater. The ratio of effluent mixed and the number of times water passes through the system are controlled to provide ample treatment. Wastewater is pumped from the dosing tank to a series of filter beds constructed of layers of fine and coarse gravel (secondary treatment). Naturally occurring aerobic microorganisms growing on the sand particles metabolize the remaining organic matter in the wastewater as it percolates through the filter. The water from the filter beds flows to a splitter box where the majority is "recirculated" back to the dosing tank, mixed with incoming wastewater before being pumped back to the filter beds for further treatment. The remaining portion of effluent in the splitter box is discharged on a continuous basis via Outfall 003 to an unnamed wetland just east of the facility.

Attachment #2 is a discharge area map of Outfall 003.

Existing Permit Limitations

The current permit, which expired on 12/31/2025, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Footnotes
Flow Rate					1
BOD_5			30 mg/L	20 mg/L	2, 3
TSS			30 mg/L	20 mg/L	2, 3
pH	9.0 s.u.	6.0 s.u.			2, 3
Dissolved Oxygen		4.0 mg/L			2, 3
Ammonia Nitrogen					1
Phosphorus					1
TKN, Nitrate+Nitrite, and Total Nitrogen					1, 4

Footnotes:

1. Monitoring only.
2. These limits are based on the Limited Aquatic Life (LAL) community of the immediate receiving water as described in s. NR 104.02(3)(b), Wis. Adm. Code.
3. **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.
4. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Sections 283.37(5) and 283.55(1)(e), Wis. Stats, and ss. NR 200.065(1)(g) and NR 200.065(1)(h), Wis. Adm. Codes, provide the authority to request this monitoring during the permit term. Total nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total Kjeldahl nitrogen (TKN) (all expressed as N).

Receiving Water Information

- Name: Unnamed wetland (UW)
- Waterbody Identification Code (WBIC): NA
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Limited aquatic life (LAL) community as listed in s. NR 104.10 Table 8 Row 17, Wis. Adm. Code, non-public water supply and recreational use.
    - Downstream impacts were not considered historically for the Grimh Flowage, Couderay River, or Chippewa River in previous limit evaluations. The surface water classification document (November 1976) determined that no surface water flow to either waterbody is apparent. The wetland complex as delineated in the "*Wetland Identification, Classification, and Delineation Report*" (October 2005) does not demonstrate surface water flow to either waterbody. Effluent flow enters the wetland complex and proceeds in a southwest direction across River Road to another large wetland complex. Effluent flow is believed to be contained in this wetland complex.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The low flows for the UW are zero.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: Not applicable where the receiving water low flows are zero.
- Multiple dischargers: None.
- Impaired water status: None.

Effluent Information

- Design flow rate(s):
    Annual average = 0.052 million gallons per day (MGD)
  For reference, the actual average flow from January 2021 – November 2025 was 0.032 MGD.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Wastewater source: Domestic wastewater with no industrial contributors.
- Water supply: Municipality waterworks.
- Additives: None.
- Effluent characterization: This facility is categorized as a minor municipality and received instructions in the application notification letter that exempt it from standard monitoring requirements. The permit required ammonia nitrogen and phosphorus monitoring during the current

permit term.

Parameters with Effluent Limits

	Average Measurement*
BOD_5	4 mg/L
TSS	3 mg/L
pH field	7.64 s.u.
Dissolved Oxygen	7.59 mg/L

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

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

Mercury – The permit application did not require monitoring for mercury because the Village of Radisson 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, sludge sampling is not available because the Village of Radisson is a RSF facility and generates solids which are hauled away as septage. 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. **Therefore, mercury monitoring is not recommended during the reissued permit term.**

PFOS and PFOA – The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Based on the type of discharge, the effluent flow rate, the lack of indirect dischargers contributing to the collection system, and nondetectable levels of PFOS/PFOA in the source water, **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. Given the fact that the Village of Radisson 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:

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

Where:

A = 0.633 and B = 90.0 for an LAL community, and
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 115 sample results were reported from January 2021 – October 2025. The maximum reported value was 8.50 s.u. (Standard pH Units). The effluent pH was 8.50 s.u. or less 99% of the time. The 1-day P_{99}, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.63 s.u. The mean plus the standard deviation multiplied by a factor of 2.33, an estimate of the upper ninety ninth percentile for a normally distributed dataset, is 8.59 s.u. Therefore, a value of 8.63 s.u. is believed to represent the maximum reasonably expected pH, and therefore most appropriate for determining daily maximum limitations for ammonia nitrogen. Substituting a value of 8.63 s.u. into the equation above yields an ATC = 3.83 mg/L.

Acute Limits based on 1-Q_{10}

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

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

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.
Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10}) if the 1-day Q_{10} flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q_{10}).
Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.
f = Fraction of the effluent flow that is withdrawn from the receiving water, and
Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is the case and the applicable daily maximum limit of 3.8 mg/L is set based on the 1-Q_{1o} method.

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 – LAL Community

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

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

The weekly and monthly average ammonia nitrogen limits calculation from the previous limit evaluation (September 2020) do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the previous limit evaluation are shown in the table below:

Weekly & Monthly Ammonia Nitrogen Limits – LAL Community

UW		Summer May – Oct.	Winter Nov. – April
Effluent Flow	Qe (MGD)	0.052	0.052
Background Information	7-Q_{10} (cfs)	0	0
	7-Q_2 (cfs)	0	0
	Maximum Temperature (°C)	21	10
	pH (s.u.)	7.58	7.07
	Reference Weekly Flow (cfs)	0	0
	Reference Monthly Flow (cfs)	0	0
Criteria mg/L	4-day Chronic	44.87	125.53
	30-day Chronic	17.95	50.21
Effluent Limits mg/L	Weekly Average	45	130
	Monthly Average	18	50

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from March 2023 – December 2023. The effluent ammonia nitrogen sample of 350.1 mg/L (04/27/2023) is recognized to be either a typo or error as this concentration is beyond what is expected in influent let alone effluent. Therefore, this samples is not considered representative of the discharge and is excluded from this evaluation.

Ammonia Nitrogen Effluent Data

Sample Date	Conc. (mg/L)
03/23/2023	1.6
05/25/2023	0.1

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06/08/2023	0.2
07/07/2023	0.2
08/10/2023	1.1
09/08/2023	2
10/12/2023	0.8
11/09/2023	4.7
12/07/2023	0.1
Mean*	1.2

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

Reasonable Potential
The need to include ammonia limits in the Village of Radisson permit is determined by calculating 99th upper percentile (or P_{99}) values for ammonia and comparing those to the calculated limits. Based on this comparison, **daily maximum limits are recommended year round during the reissued permit term. Village of Radisson shall notify the Department if the single limit or the variable limits based on effluent pH are preferred.**

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

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

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

If the daily maximum limits varying with effluent pH are preferred, the additional limits should be set equal to either the highest recommended limit or the calculated WQBELs whichever are more stringent. **Therefore, the weekly average limit of 83 mg/L is required in the reissued permit during November – April. The remainder of the weekly and monthly average limits are set equal to the calculated WQBELs shown in the table above.** If the single daily maximum limit of 3.8 mg/L is preferred, **the monthly and weekly average limits of 3.8 mg/L are recommended in the reissued permit.**

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. Additional limits to meet the requirements in s. NR 106.07, Wis. Adm Code, are denoted in bold text.

Final Ammonia Nitrogen Limits

Month Range	Daily Maximum (mg/L)	Weekly Average (mg/L)	Monthly Average (mg/L)
Single	3.8	**3.8**	**3.8**
Variable			
May – October	Variable	**45**	**18**
November – April		**83**	**50**

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.

The Village of Radisson had previously been exempted from disinfection based on the LAL or Limited Forage Fish (LFF) community classification of the receiving water. Section NR 210.06(3)(g), Wis. Adm. Code, states that disinfection decisions may be made based on the hydrologic classifications listed in s. NR 104.02(1), Wis. Adm. Code (**not** on the water quality classifications - i.e., LFF, LAL - that are defined in s. NR 104.02(3), Wis. Adm. Code). The hydrologic classification for the UW is listed in ch. NR 104, Wis. Adm. Code, as a wetland. Wetlands are surface waters of the state, are therefore designated as recreational use and disinfection should not be exempted based solely on this hydrological classification.

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

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

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

PART 5 – PHOSPHORUS

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

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

Annual Average Mass Total Phosphorus Loading

Month	Average Phosphorus Concentration (mg/L)	Total Effluent Flow (Million Gallons)	Calculated Mass (lbs/month)
April 2023	0.70	3.5	20
May 2023	0.78	1.8	11
June 2023	1.27	1.0	11
July 2023	2.40	1.0	20
Aug. 2023	3.22	1.0	28
Sept. 2023	2.98	1.0	25
Oct. 2023	2.65	1.1	24
Nov. 2023	1.64	0.84	11
Dec. 2023	1.69	0.79	11
		Average =	18

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

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

Phosphorus criteria in s. NR 102.06, Wis. Adm. Code, do not apply to limited aquatic life waters as described in s. NR 102.06(6)(d), Wis. Adm. Code. These waters were not included in the USGS/WDNR stream and river studies and, therefore, the Department lacked the technical basis to determine and propose applicable criteria. At some time in the future, the Department may adopt phosphorus criteria based on new studies focusing on limited aquatic life waters. *The Guidance for Implementing Wisconsin's Phosphorus Water Quality Standards for Point Source Discharges (2020)* suggests that during the interim, WQBELs should be based on the criteria and flow conditions for the next stream segment downstream (or downstream lake or reservoir, if appropriate), because ss. 217.12 and 217.13, Wis. Adm. Code, state that the Department must set WQBELs to protect downstream waters. The UW is classified as

a LAL community from Outfall 003 downstream into the wetland complex. The discharge is contained within the wetland complex does not reach the Couderay or Chippewa Rivers via a surface water connection. **Therefore, a phosphorus WQBEL is not applicable to the Village of Radisson.**

PART 6 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in Chapters NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. The daily maximum effluent temperature limitation shall be 86 °F for discharges to surface waters classified as a LAL community according to s. NR 104.02(3)(b)1, Wis. Adm. Code, except for those classified as wastewater effluent channels and wetlands regulated under ch. NR 103 and described in s. NR 106.55(2), Wis. Adm. Code, which has a daily maximum effluent temperature limitation of 120 ºF. The 120° F limit applies because the hydrologic classification is listed as a wetland in ch. NR 104, Wis. Adm. Code.

At temperatures above approximately 103° F, conventional biological treatment systems do not function properly and experience upsets. There is no indication that this has ever occurred in this treatment system, so there is no reasonable potential for the discharge to exceed this limit. **Therefore, temperature limits and monitoring are not recommended during the reissued permit term.**

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).

Guidance in Chapter 1.11 of the WET Guidance Document (WET Testing of Minor Municipal Discharges) was consulted. This is a minor municipal discharge (< 1.0 MGD) comprised solely of domestic wastewater, no history of WET failures, no additives, and no toxic compounds detected at levels of concern. **No WET testing is recommended at this time because of the low risk in effluent toxicity.**

Attachment #2