# Permit Fact Sheet

## General Information

| | |
|---|---|
| Permit Number | WI-0060801-11-0 |
| Permittee Name and Address | VILLAGE OF SPRING GREEN<br>PO Box 158 112 West Monroe Street, Spring Green, WI 53588 |
| Permitted Facility Name and Address | Spring Green Wastewater Treatment Facility<br>621 CARPENTER LANE, SPRING GREEN, WISCONSIN |
| Permit Term | July 01, 2025 to June 30, 2030 |
| Discharge Location | North bank of the Wisconsin River, approximately one-half mile from treatment plant. SW ¼ of SE ¼, Section 13, T8N, R3E. |
| Receiving Water | Wisconsin River (Bear Creek Watershed, LW14 – Lower Wisconsin River Basin) in Sauk County |
| Stream Flow ($Q_{7,10}$) | 2400 cfs |
| Stream Classification | Warm Water Sport Fish (WWSF), non-public water supply |
| Discharge Type | Existing, Continuous |
| Annual Average Design Flow (MGD) | 0.26 MGD |
| Industrial or Commercial Contributors | Cardinal Glass Industries |
| Plant Classification | A1 - Suspended Growth Processes; B - Solids Separation; C - Biological Solids/Sludges; P - Total Phosphorus; D - Disinfection; L - Laboratory; SS - Sanitary Sewage Collection System |
| Approved Pretreatment Program? | N/A |

## Facility Description

The Village of Spring Green operates a secondary wastewater treatment facility providing treatment for domestic and commercial wastewater. Treatment consists of mechanical screening and grit removal, oxidation ditch secondary treatment followed by chemical phosphorus removal, final clarification, and ultraviolet (UV) disinfection prior to discharge to the Wisconsin River. UV disinfection replaced effluent chlorine contact disinfection in 2021. Sludge that is produced is aerobically digested and stored on-site prior to land application on department approved sites.

## Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land application reports, and a site visit on February 05, 2024, this facility has been found to be in substantial compliance with their current permit.

# 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 | N/A – Not required to monitor | Influent: 24-hr flow proportional composite samples shall be collected at the influent wet well. |
| 001 | 0.14 MGD<br>(January 2019 – September 2024 Average) | Effluent: 24-hr flow proportional composite samples shall be collected prior to UV disinfection. Grab samples shall be collected from the effluent wet well after UV disinfection, prior to discharge to the Wisconsin River. An ultrasonic flow meter is located at the end of the UV disinfection tank. |
| 002 | 25 Dry U.S. Tons<br>(2024 Permit Application) | Aerobically digested, Liquid, Class B. Representative sludge samples shall be collected from the sample tap in the sludge pump room. |

# Permit Requirements

# 1 Influent – Monitoring Requirements

## Sample Point Number: 701- INFLUENT

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

### Changes from Previous Permit:

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

### Explanation of Limits and Monitoring Requirements

Monitoring of 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

## 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 | |
| pH Field | Daily Max | 9.0 su | Daily | Grab | |
| pH Field | Daily Min | 6.0 su | Daily | Grab | |
| E. coli | Geometric Mean - Monthly | 126 #/100 ml | Weekly | Grab | May - September |
| E. coli | % Exceedance | 10 Percent | Monthly | Calculated | May - September |
| Phosphorus, Total | Monthly Avg | 1.0 mg/L | 3/Week | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia (NH3-N) Total | | mg/L | Monthly | 24-Hr Flow Prop Comp | Monthly monitoring in 2029. |
| Chloride | | mg/L | Monthly | 24-Hr Flow Prop Comp | Monthly monitoring in 2029. |
| 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 Series Monitoring 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

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

**Flow:** The sample frequency for flow has been changed from "Continuous" to "Daily" for eDMR reporting purposes.

**pH:** The monitoring frequency has changed to "Daily".

**E. coli:** Fecal coliform monitoring and limits have been replaced with Escherichia coli (E. coli) monitoring and limits.

**Ammonia:** The monitoring year has been updated.

**Chloride:** The monitoring year has been updated.

**Total Nitrogen Monitoring (TKN, N02+N03 and Total N):** Annual monitoring is required in specific quarters as outlined in the permit.

## Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached Water Quality-Based Effluent Limitations (WQBEL) for the Spring Green Wastewater Treatment Facility memo dated January 22, 2025, prepared by Zainah Masri and used for this reissuance.

**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.

**Ammonia:** Statistics based upon ammonia data submitted during the permit term do not show reasonable potential for the discharge to exceed the calculated ammonia nitrogen limits. Monthly monitoring during the fourth year of the permit term is included pursuant to s. NR 106.33(1), Wis. Adm. Code. Due to the high amount of dilution available and the low variability of the effluent data, the department has determined that one year of monitoring is appropriate.

**Total Nitrogen Monitoring (NO2+NO3, TKN and Total N): T**he Department has included effluent monitoring for Total Nitrogen through the authority under s. 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.

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

**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.

# 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 | Fecal Coliform | Aerobic SOUR Test | Land Application | 25 |

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? **Yes.**

If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility

Is a priority pollutant scan required? **No, design flow is less than 5 MGD.**

Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.

## Sample Point Number: 002- SLUDGE

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

| Monitoring Requirements and Limitations | | | | | |
|---|---|---|---|---|---|
| **Parameter** | **Limit Type** | **Limit and Units** | **Sample Frequency** | **Sample Type** | **Notes** |
| Selenium Dry Wt | High Quality | 100 mg/kg | Annual | Composite | |
| Zinc Dry Wt | Ceiling | 7,500 mg/kg | Annual | Composite | |
| Zinc Dry Wt | High Quality | 2,800 mg/kg | Annual | Composite | |
| Nitrogen, Total Kjeldahl | | Percent | Annual | Composite | |
| Nitrogen, Ammonium (NH4-N) Total | | Percent | Annual | Composite | |
| Phosphorus, Total | | Percent | Annual | Composite | |
| Phosphorus, Water Extractable | | % of Tot P | Annual | Composite | |
| Potassium, Total Recoverable | | Percent | Annual | Composite | |
| Radium 226 Dry Wt | | pCi/g | Annual | Composite | |
| PCB Total Dry Wt | Ceiling | 50 mg/kg | Once | Composite | Monitoring once in 2026 |
| PCB Total Dry Wt | High Quality | 10 mg/kg | Once | Composite | Monitoring once in 2026 |
| PFOA + PFOS | | ug/kg | Annual | Calculated | Report the sum of PFOA and PFOS. See PFAS Permit Sections for more information. |
| PFAS Dry Wt | | | Annual | Grab | Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information. |

## Changes from Previous Permit:

Sludge limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit.

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

## 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), Wis. Adm. Code. Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07(7), Wis. Adm. Code for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k), Wis. Adm. Code. Radium requirements are addressed in s. NR 204.07(3)(n), Wis. Adm. Code.

**PFAS:** The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment to determine future land application rates and released this risk assessment in January of 2025. The department is evaluating this new information. Until a decision is made, the "Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS" may be followed.

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

## Land Application Management Plan

A management plan is required for the land application system.

| Required Action | Due Date |
|---|---|
| **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. | 06/30/2026 |

### Explanation of Schedule

An up-to-date Land Application Management Plan is required that documents how the permittee will manage the land application of biosolids consistent with ch. NR 204, Wis. Adm. Code.

# Attachments

Water Quality Based Effluent Limits, dated January 22, 2025

# Justification Of Any Waivers From Permit Application Requirements

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

**Prepared By:** BetsyJo Howe, Wastewater Specialist **Date:** 04/14/2025

# CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: January 22, 2025

TO: Betsyjo Howe – SCR/Fitchburg

FROM: Zainah Masri – WY/3

SUBJECT: Water Quality-Based Effluent Limitations for the Spring Green Wastewater Treatment Facility
WPDES Permit No. WI-0060801-11-0

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 Spring Green Wastewater Treatment Facility in Sauk County. This municipal wastewater treatment facility (WWTF) discharges to the Wisconsin River located in the Bear Creek Watershed in the Lower Wisconsin 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 001:

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | 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 | | | | | 5 |
| Bacteria | | | | | 3 |
| Final Limit *E. coli* | | | | 126 #/100 mL geometric mean | |
| Chloride | | | | | 4 |
| Phosphorus | | | | 1.0 mg/L | |
| TKN, Nitrate+Nitrite, and Total Nitrogen | | | | | 6 |

Footnotes:

1. No changes from the current permit.
2. Monitoring only.
3. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
4. Monitoring at a frequency to ensure that 11 samples are available at the next permit issuance.
5. Monitoring throughout the permit term.
6. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, annual total nitrogen monitoring is recommended for all minor municipal permittees. Total Nitrogen is the sum of nitrate ($NO_3$), nitrite ($NO_2$), and total Kjeldahl nitrogen (TKN) (all expressed as N).

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

The recommended limits meet the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Code, and additional limits are not required.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Zainah Masri at Zainah.Masri@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Ammonia Nitrogen Calculations and Map

PREPARED BY: Zainah Masri, Water Resources Engineer Zainah Masri

APPROVED BY: Diane Figiel _____ Date: 01/22/2025

Water Resources Engineer

E-cc: Tanner Connors, Wastewater Engineer – SCR/Fitchburg
Amy Garbe, Acting Regional Wastewater Supervisor – SER/Waukesha
Diane Figiel, Water Resources Engineer – WY/3
Kari Fleming, NR Program Manager – WY/3
Nate Willis, Wastewater Engineer – WY/3

Attachment #1

**Water Quality-Based Effluent Limitations for**
**Spring Green Wastewater Treatment Facility**

**WPDES Permit No. WI-000060801-11-0**

Prepared by: Zainah Masri

## PART 1 – BACKGROUND INFORMATION

### Facility Description

Spring Green Wastewater Treatment Facility is a secondary wastewater treatment facility providing treatment for domestic, commercial . Treatment provided consists of mechanical screening removal, oxidation ditch secondary treatment, phosphorus removal using ferric chloride, final clarification, and UV disinfection. UV disinfection replaced effluent chlorine contact disinfection in 2021.

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

### Existing Permit Limitations

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

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Footnotes |
|---|---|---|---|---|---|
| Flow Rate | | | | | 3 |
| $BOD_5$ | | | 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 | | | **656#/100 mL** **geometric mean** | 400#/100 mL geometric mean | 4 |
| Phosphorus | | | | 1.0 mg/L | - |
| Chloride | | | | | 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 from January 1, 2023 to December 31, 2023.
3. Monitoring only.
4. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7) are included in bold.

**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: The following 7-$Q_{10}$ and 7-$Q_2$ values are from USGS for the Wisconsin River near Spring Green where Outfall 001 is located.
  7-$Q_{10}$ = 2400 cfs (cubic feet per second)
  7-$Q_2$ = 3500 cfs
  90-$Q_{10}$ = 3500 cfs
  Harmonic Mean Flow = 6150 cfs
- Hardness = 72 mg/L as $CaCO_3$. This value represents the geometric mean of data from February 1977 to January 1992 at the USGS Station Wisconsin River at Wisconsin Dells.
- % 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 monitoring station for the Wisconsin River at Wisconsin Dells is used for this. 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: The Wisconsin River is listed as impaired for PCB's at the point of discharge. Upstream of the discharge the Wisconsin River is listed as impaired for phosphorus and a TMDL is in place for the discharger in the phosphorus impaired segment.

**Effluent Information**

- Design flow rate(s):
  Annual average = 0.26 MGD (Million Gallons per Day)
  For reference, the actual average flow from January 2019 to September 2024 was 0.14 MGD.
- Hardness = 307 mg/L as $CaCO_3$. This value represents the geometric mean of data from January 2024 in 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: Public drinking water with water supply from the Village of Spring Green.
- Additives: Ferric Chloride
- 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 ammonia, chloride, hardness and phosphorus.
- 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

**Copper Effluent Data**

| Sample Date | Copper µg/L | Sample Date | Copper µg/L | Sample Date | Copper µg/L |
|---|---|---|---|---|---|
| 12/13/2023 | 12.6 | 12/25/2023 | 11.1 | 01/06/2024 | 13.5 |
| 12/16/2023 | 11.2 | 12/28/2023 | 11.3 | 01/09/2024 | 11.5 |
| 12/19/2023 | 10.6 | 12/31/2023 | 10.7 | 01/12/2024 | 11.8 |
| 12/22/2023 | 11.6 | 01/03/2024 | 11.3 | | |
| 1-day $P_{99}$ = 14 µg/L | | | | | |
| 4-day $P_{99}$ = 13 µg/L | | | | | |

**Chloride Effluent Data**

| Sample Date | Chloride mg/L | Sample Date | Chloride mg/L | Sample Date | Chloride mg/L |
|---|---|---|---|---|---|
| 03/22/2023 | 410 | 06/13/2023 | 430 | 10/12/2023 | 480 |
| 03/29/2023 | 410 | 07/24/2023 | 440 | 11/30/2023 | 490 |
| 04/19/2023 | 450 | 08/15/2023 | 370 | 12/15/2023 | 430 |
| 05/15/2023 | 390 | 09/20/2023 | 420 | | |
| 1-day $P_{99}$ = 519 mg/L | | | | | |
| 4-day $P_{99}$ = 472 mg/L | | | | | |

The following table presents the average concentrations and loadings at Outfall 001 from January 2019 to September 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 | Average Mass Discharged |
|---|---|---|
| $BOD_5$ | 5.5 mg/L | - |
| TSS | 9.6 mg/L | - |
| pH field | 7.6 s.u. | - |
| Phosphorus | 0.66 mg/L | 0.44 lbs/day |
| Fecal Coliform | 403 #/ 100 mL | - |

## 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 99$^{th}$ 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 Spring Green 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 for all the detected substances. 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 = 1920 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 | MAX. EFFL. LIMIT** | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 1-day $P_{99}$ | 1-day MAX. CONC. |
|---|---|---|---|---|---|---|---|
| Arsenic | | 340 | 680 | 136 | <7.7 | | |
| Cadmium | 307 | 37 | 75 | 15 | <0.41 | | |
| Chromium | 301 | 4,446 | 8,892 | 1,778 | 1.4 | | |
| Copper | 307 | 45 | 89 | | | 14 | 13.5 |
| Lead | 307 | 316 | 632 | 126 | 1.6 | | |
| Nickel | 268 | 1080 | 2161 | 432 | 2.7 | | |
| Zinc | 307 | 321 | 642 | 128 | 30 | | |
| Chloride (mg/L) | | 757 | 1514 | | | 519 | 490 |

* 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-$Q_{10}$ 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 = 600 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. | WEEKLY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 4-day $P_{99}$ |
|---|---|---|---|---|---|---|---|
| Arsenic | | 152 | 6.6 | 217,309 | 43,462 | <7.7 | |
| Cadmium | 72 | 2.0 | 0.09 | 2,709 | 542 | <0.41 | |
| Chromium | 72 | 101 | 2.8 | 146,488 | 29,298 | 1.4 | |
| Copper | 72 | 7.8 | 7.2 | 918 | | | 13 |
| Lead | 72 | 20 | 3.1 | 25,808 | 5,162 | 1.6 | |
| Nickel | 72 | 40 | 0.7 | 57,953 | 11,591 | 2.7 | |
| Zinc | 72 | 90 | 2.20 | 131,518 | 26,304 | 30 | |
| Chloride (mg/L) | | 395 | 15 | 567,150 | | | 472 |

**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 = 1537 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 | 0.09 | 1414137 | 282827.4 | <0.41 |
| Chromium (+3) | 3,818,000 | 2.8 | 14,595,707,693 | 2,919,141,539 | 1.4 |
| Lead | 140 | 3.1 | 523,354 | 104,671 | 1.6 |
| Nickel | 43,000 | 0.7 | 164,380,743 | 32,876,149 | 2.7 |

**Monthly Average Limits based on Human Cancer Criteria (HCC)**
RECEIVING WATER FLOW = 1537 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 | 6.6 | 25,620 | 5,124 | <7.7 |

**Conclusions and Recommendations**
Based on a comparison of the effluent data and calculated effluent limitations, **effluent limitations are not required.**

Copper – Considering available effluent data from December 2023 to January 2024, the 1-day $P_{99}$ concentration is 14 µg/L, with a maximum concentration of 13.5 µg/L. Neither the maximum effluent concentration nor 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 not required.**

Chloride – Considering available effluent data from the current permit term March 2023 to December 2023 the 1-day $P_{99}$ chloride concentration is 519 mg/L, and the 4-day $P_{99}$ of effluent data is 472 mg/L.

These effluent concentrations are below the calculated WQBELs for chloride, **therefore no effluent limits are needed. 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.**

Mercury – The permit application did not require monitoring for mercury because the Spring Green 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), Wis. Adm. Code." A review of the past five years of sludge characteristics data reveals that all the sample results are within expected analytical ranges and well below the 17 mg/kg level. The average concentration in the sludge from September 2019 to October 2023 was 0.64 mg/kg, with a maximum reported concentration of 1.7 mg/kg. **Therefore, no mercury monitoring is recommended at Outfall 001.**

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 types of indirect dischargers contributing to the collection system PFOS and PFOA **monitoring is not recommended.**

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 monthly monitoring for one year of the permit term however data was not collected in January and February

**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
pH (s.u.) = that characteristic of the effluent.

The effluent pH data was examined as part of this evaluation. A total of 901 sample results were reported from January 2019 to September 2024. The maximum reported value was 9.6 s.u. (Standard pH Units). The effluent pH was 8.5 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 8.4 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 8.4 s.u. Therefore, a value of 8.4 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 8.4 s.u. into the equation above yields an ATC = 3.9 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 | 7.8 |
| 1-$Q_{10}$ | 18,259 |

The 2×ATC method yields the most stringent limits for Spring Green 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, WWFF & LFF**

| 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 |

Attachment #1

| Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L | Effluent pH s.u. | Limit mg/L |
|---|---|---|---|---|---|
| 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 weekly and monthly average ammonia nitrogen limits calculation from the previous memo do not change** because there have been no changes in the effluent and receiving water flow rates. The calculations from the WQBEL memo dated January 13, 2009 are shown in Attachment #3.

**Effluent Data**
The following table evaluates the statistics based upon ammonia data reported from March 2023 to December 2023 with those results being compared to the calculated limits to determine the need to include ammonia limits in the Spring Green Wastewater Treatment Facility permit for the respective month ranges. That need is determined by calculating 99$^{th}$ upper percentile (or $P_{99}$) values for ammonia during each of the month ranges and comparing the daily maximum values to the daily maximum limit.

**Ammonia Nitrogen Effluent Data**

| Sample Date | Ammonia Nitrogen mg/L | Sample Date | Ammonia Nitrogen mg/L | Sample Date | Ammonia Nitrogen mg/L |
|---|---|---|---|---|---|
| 3/22/2023 | 4.9 | 6/13/2023 | 0.2 | 10/12/2023 | 0.2 |
| 3/29/2023 | 0.2 | 7/24/2023 | 0.2 | 11/30/2023 | 0.2 |
| 4/19/2023 | 0.2 | 8/15/2023 | 0.3 | 12/15/2023 | 0.2 |
| 5/15/2023 | 0.87 | 9/20/2023 | 0.2 | | |
| 1-day $P_{99}$ = 6.0 mg/L | | | | | |
| 4-day $P_{99}$ = 3.5 mg/L | | | | | |

**Ammonia Nitrogen Effluent Data**

| Ammonia Nitrogen mg/L | |
|---|---|
| 1-day $P_{99}$ | 6.01 |
| 4-day $P_{99}$ | 3.45 |
| 30-day $P_{99}$ | 1.50 |
| Mean | 0.70 |
| Std | 1.41 |
| Sample size | 11 |
| Range | 0.20-4.90 |

Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. **No limits are needed however monitoring is recommended in the fourth year of the permit term**.

**Conclusions and Recommendations**

In summary, based on reported effluent nitrogen ammonia concentrations and high amount of dilution available, there is no reasonable potential for ammonia levels to exceed the calculated ammonia nitrogen limits. Therefore, **no limits and monitoring only are recommended pursuant to s. NR 106.33(1), Wis. Adm. Code. Monitoring throughout the permit term is recommended.**

## 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 the Spring Green 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 current recreational period and the required disinfection season.

**Effluent Data**

Spring Green Wastewater Treatment Facility has monitored effluent *E. coli* from June 2023 to September 2023 and a total of 14 results are available. This data was submitted with lab sheets as the data reported in the DMRs were reported incorrectly as *E.coli* when they were in fact fecal coliform. A maximum of <2420 counts/100 mL was reported for September 26. 2023, however this value is not considered representative of the discharge. A geometric mean of 126 counts/100 mL was exceeded once in September 2023, with a maximum value of 330 counts/mL. Effluent data has not exceeded 410 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 Spring Green Wastewater Treatment Facility currently has a limit of 1.0 mg/L, this limit should

be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

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

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

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

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

Where:

WQC = 0.100 mg/L for Wisconsin River.
Qs = 100% of the 7-$Q_2$ of 3500 cfs
Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
Qe = effluent flow rate = 0.26 MGD = 0.402 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

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

A previous evaluation resulted in a WQBEL of 43.6 mg/L using a background concentration of 0.095 mg/L. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance.

A review of all available in stream total phosphorus data stored in the Surface Water Integrated Monitoring System database indicates that no additional data is available and the median background total phosphorus concentration in Wisconsin River at Prairie du sac (SWIMS station ID 5730001) is 0.095 mg/L, just upstream from the point of discharge to Wisconsin River.

| | |
|---|---|
| SWIMS ID | 5730001 |
| Station Name | Monitoring station at Prairie du Sac |
| Waterbody | Wisconsin River |
| Sample Count | 4 samples |
| First Sample | 05/23/2007 |
| Last Sample | 09/17/2007 |
| Mean | 0.089 mg/L |
| Median | 0.095 mg/L |

Substituting a median value of 0.095 mg/L into the limit calculation equation above, the calculated limit is 43.6 mg/L.

The 1.0 mg/L technology-based limit is more stringent than the calculated water quality-based limit of 43.6 mg/L. As such, the 1.0 mg/L, expressed as a monthly average, is recommended to be retained.

**Effluent Data**
The following table summarizes effluent total phosphorus monitoring data from January 2019 to September 2024.

**Total Phosphorus Effluent Data**

| | **Phosphorus mg/L** |
|---|---|
| 1-day $P_{99}$ | 3.5 |
| 4-day $P_{99}$ | 1.9 |
| 30-day $P_{99}$ | 1.03 |
| Mean | 0.66 |
| Std | 0.73 |
| Sample size | 894 |
| Range | 0.02 - 17.3 |

## 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, the Qs: Qe ratio is greater than 20:1 (5966:1) for Spring Green Wastewater Treatment Facility. Therefore, the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), 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. Therefore, there is no reasonable potential for the discharge to exceed this limit, and **no effluent limits or monitoring are recommended for temperature**.

## PART 7 – WHOLE EFFLUENT TOXICITY (WET)

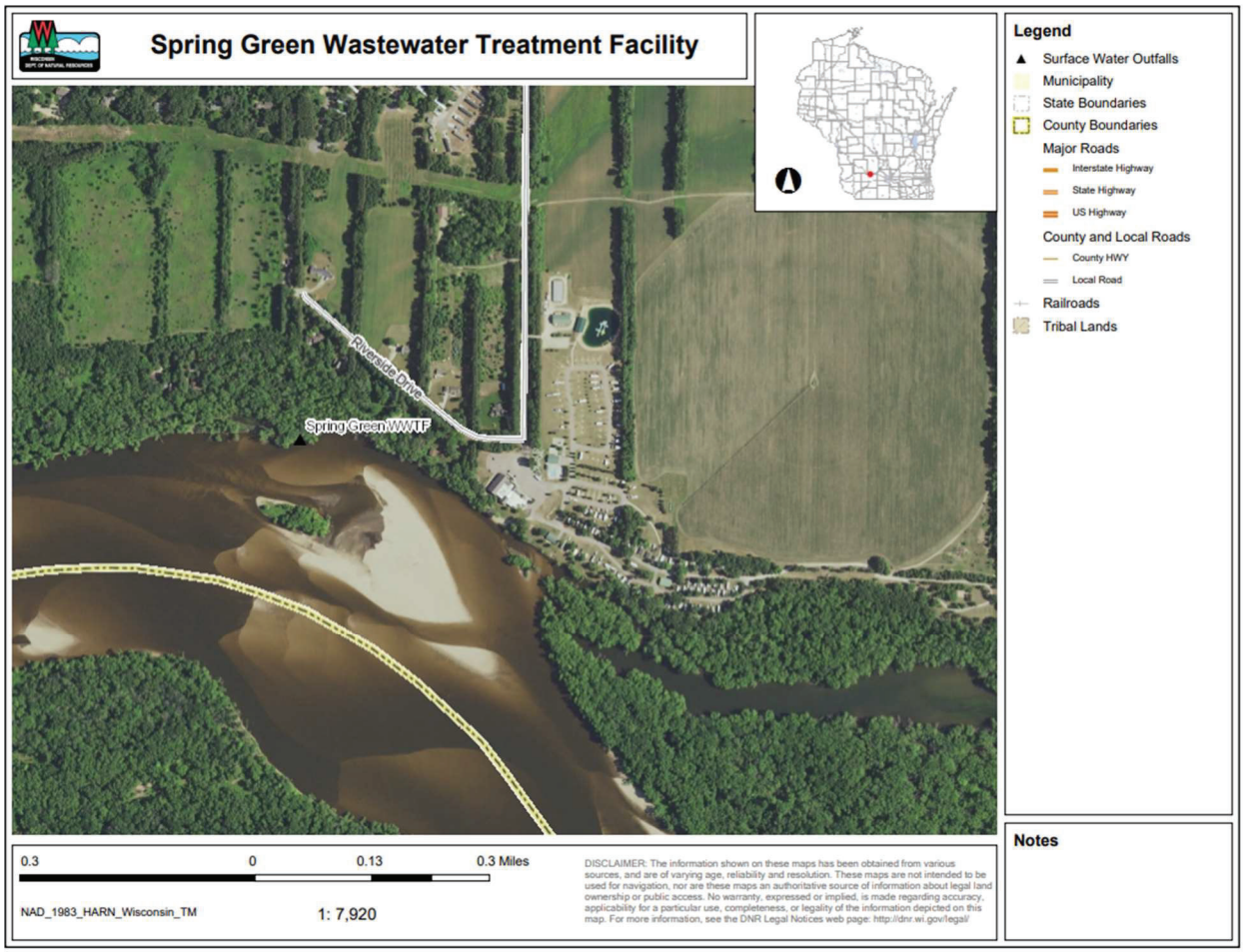
WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data 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 $LC_{50}$ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.

- Chronic 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 the Spring Green Wastewater Treatment Facility, that ratio is approximately 5966:1. 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 Spring Green Wastewater Treatment Facility so the need for acute and chronic WET testing will not be considered further.

Attachment #2

Site Map:



Attachment #3

## Ammonia Nitrogen Effluent Limits from January 13, 2009 WQBEL Memo

| **CLASSIFICATION: WARMWATER SPORTFISH COMMUNITY** | | | |
|---|---|---|---|
| EFFLUENT FLOW (MGD) | 0.26 | | |
| EFFLUENT FLOW (cfs) | 0.402 | | |
| **BACKGROUND INFORMATION:** | | | |
| | ***May-Sept.*** | ***Oct.-March*** | ***April*** |
| 7-$Q_{10}$ (cfs) | 2400 | 2400 | 2400 |
| 7-$Q_2$ (cfs) | 3500 | 3500 | 3500 |
| Ammonia (mg/L) | 0.06 | 0.12 | 0.06 |
| Temperature (deg C) | 25 | 3 | 12 |
| pH (s.u.) | 8.21 | 7.97 | 7.97 |
| % of river flow used | 100 | 25 | 50 |
| Reference weekly flow | 2400 | 600 | 1200 |
| Reference monthly flow | 2975 | 743.75 | 1487.5 |
| **CRITERIA (in mg/L)** | | | |
| 4-day Chronic (@ backgrd. pH) | | | |
| early life stages present | 2.24 | 6.35 | 6.35 |
| early life stages absent | 2.24 | 10.31 | 7.47 |
| 30-day Chronic (@ backgrd. pH) | | | |
| early life stages present | 0.90 | 2.54 | 2.54 |
| early life stages absent | 0.90 | 4.12 | 2.99 |
| **EFFLUENT LIMITS (in mg/L)** | | | |
| **Weekly average** | | | |
| early life stages present | 13034.89 | 9298.73 | 18770.08 |
| early life stages absent | | 15210.59 | 22111.06 |
| **Monthly average** | | | |
| early life stages present | 6196.69 | 4476.89 | 9173.11 |
| early life stages absent | | 7407.81 | 10829.57 |

**Note:** Early life stages present limits apply during the months of April through September and the early life stages absent limits apply to October through March for warm water sport fish community streams.