

Permit Fact Sheet

General Information

| | | |
|-----------------------------------|--|-----------|
| Permit Number: | WI-0029271-10-1 *Modification | |
| Permittee Name: | VILLAGE OF LOWELL | |
| Address: | W8148 STH 16 | |
| City/State/Zip: | Lowell WI 53557 | |
| Discharge Location: | Beaver Dam River, west of driveway to sewer plant (S½ of NE ¼ of Section 22, T10N R14E, Dodge County) | |
| Receiving Water: | Beaver Dam River (Beaver Dam River Watershed, UR03 – Upper Rock River Basin) in Dodge County) | |
| Stream Flow (Q _{7,10}): | 5 cfrs | |
| Stream Classification: | Warm Water Sport Fish (WWSF), non-public water supply. | |
| Design Flow(s) | Daily Maximum | 0.08 MGD |
| | Monthly Maximum | 0.053 MGD |
| | Annual Average | 0.038 MGD |
| Significant Industrial Loading? | None | |
| Operator at Proper Grade? | Facility is Basic with subclasses A3 – Recirculating Media Filters, D – Disinfection, SS – Sanitary Sewage Collection System | |
| Approved Pretreatment Program? | N/A | |

Facility Description

The Lowell Wastewater Treatment Facility is a recirculating sand filter (RSF) system. Wastewater enters two septic tanks (totaling of 80,000 gallons) where solids will settle out. The wastewater then enters a dosing chamber where the wastewater is mixed with treated wastewater (effluent). It is then evenly distributed over one of four filter beds (each approximately 74 ft x 36 ft) with layers of fine and coarse sand. Naturally occurring microorganisms living on the sand particles clean the influent. Three filters are used with one bed in a resting phase or used during times of peak flow. The water from the filter is recirculated into the dosing chamber and is filtered again. After refiltration, the effluent is disinfected using a UV-light system and discharged into the Beaver Dam River. The plant is designed to treat 0.040 MGD.

| Sample Point Designation | | |
|--------------------------|---|---|
| Sample Point Number | Discharge Flow, Units, and Averaging Period | Sample Point Location, Waste Type/sample Contents and Treatment Description (as applicable) |
| | | |

| Sample Point Designation | | |
|--------------------------|--|--|
| Sample Point Number | Discharge Flow, Units, and Averaging Period | Sample Point Location, Waste Type/sample Contents and Treatment Description (as applicable) |
| 702 | 0.042 MGD (December 2015 – December 2020 Average) | Representative influent samples shall be collected at the end of the force main prior to the flow meter. |
| 003 | 0.039 MGD (December 2015 – December 2020 Average) | Representative effluent samples shall be collected after the ultraviolet disinfection unit prior to discharge to the Beaver Dam River. |
| 990 | N/A – Not Reported | All septic tank solids shall be managed in compliance with chapter NR 113, Wis. Adm. Code, for servicing septic tanks. |

1 Influent - Proposed Monitoring

Sample Point Number: 702- INFLUENT - RSF

| 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/Month | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | | mg/L | 2/Month | 24-Hr Flow Prop Comp | |

Changes from Previous Permit:

None.

Explanation of Limits and Monitoring Requirements

BOD5 and Total Suspended Solids (TSS) – Tracking of BOD5 and TSS is required for percent removal tracking requirements found in s. NR 210.05, Wis. Adm. Code and Section 5.4.6 of the permit. These are standard monitoring requirements for a municipal treatment facility of this size.

2 Surface Water - Proposed Monitoring and Limitations

Sample Point Number: 003- EFFLUENT - RSF

| Monitoring Requirements and Limitations | | | | | |
|---|------------|-----------------|------------------|-------------|-------|
| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
| Flow Rate | | MGD | Daily | Continuous | |

Monitoring Requirements and Limitations

| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
|----------------------------------|----------------------|------------------------|-------------------------|----------------------|--|
| BOD5, Total | Weekly Avg | 45 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| BOD5, Total | Monthly Avg | 30 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | Weekly Avg | 45 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | Monthly Avg | 30 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | Weekly Avg | 32 lbs/day | Weekly | 24-Hr Flow Prop Comp | Limit effective upon reissuance for the months of January, March, April, May, June, July, August, September, October, November, and December. |
| Suspended Solids, Total | Weekly Avg | 35 lbs/day | Weekly | 24-Hr Flow Prop Comp | Limit effective upon reissuance for the month of February |
| Suspended Solids, Total | Monthly Avg | 19 lbs/day | Weekly | 24-Hr Flow Prop Comp | Limit effective upon reissuance for the months of January, March, April, May, June, July, August, September, October, November, and December. |
| Suspended Solids, Total | Monthly Avg | 21 lbs/day | Weekly | 24-Hr Flow Prop Comp | Limit effective upon reissuance for the month of February |
| pH Field | Daily Max | 9.0 su | Weekly | Grab | |
| pH Field | Daily Min | 6.0 su | Weekly | Grab | |
| Nitrogen, Ammonia Variable Limit | | mg/L | Weekly | 24-Hr Flow Prop Comp | Using the daily pH result look up the applicable ammonia limit in the pH Dependent Daily Max Ammonia Table in 2.2.1.2 below & report the variable limit on the daily record (DMR). |
| Nitrogen, Ammonia (NH3-N) Total | Daily Max - Variable | mg/L | Weekly | 24-Hr Flow Prop Comp | Enter the daily ammonia result on the daily record (DMR) and compare the Nitrogen, Ammonia Variable Limit to determine |

Monitoring Requirements and Limitations

| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
|---------------------------------|--------------------------|------------------------|-------------------------|----------------------|--|
| | | | | | compliance. |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 108 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 108 mg/L | Weekly | 24-Hr Flow Prop Comp | |
| Fecal Coliform | Geometric Mean - Monthly | 400 #/100 ml | Weekly | Grab | Interim limit effective May - September annually until the final E. coli limit goes into effect per the "Effluent Limitations for E. coli" Schedule. |
| E. coli | | #/100 ml | Weekly | Grab | Monitoring only May - September annually until the final limit goes into effect per the "Effluent Limitations for E. coli" Schedule. |
| E. coli | Geometric Mean - Monthly | 126 #/100 ml | Weekly | Grab | Limit Effective May - September annually per the "Effluent Limitations for E. coli" Schedule. |
| E. coli | % Exceedance | 10 Percent | Monthly | Grab | Limit Effective May - September annually per the "Effluent Limitations for E. coli" Schedule. See the "E. coli Percent Limit" section below. Enter the result in the DMR on the last day of the month. |
| Phosphorus, Total | Monthly Avg | 4.6 mg/L | Monthly | 24-Hr Flow Prop Comp | |
| Phosphorus, Total | Monthly Avg | 0.64 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the months of January, June, and November beginning June 1, 2023. |
| Phosphorus, Total | Monthly Avg | 0.86 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the month of February beginning February 1, 2024. |
| Phosphorus, Total | Monthly Avg | 0.88 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the month of March beginning |

| Monitoring Requirements and Limitations | | | | | |
|--|-------------------|------------------------|-------------------------|----------------------|---|
| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
| | | | | | March 1, 2024. |
| Phosphorus, Total | Monthly Avg | 0.71 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the month of April beginning April 1, 2023. |
| Phosphorus, Total | Monthly Avg | 0.66 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the month of May beginning May 1, 2023. |
| Phosphorus, Total | Monthly Avg | 0.53 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the month of July beginning July 1, 2023. |
| Phosphorus, Total | Monthly Avg | 0.65 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the month of August beginning August 1, 2023. |
| Phosphorus, Total | Monthly Avg | 0.7 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the months of September and October beginning September 1, 2023. |
| Phosphorus, Total | Monthly Avg | 0.56 lbs/day | Monthly | 24-Hr Flow Prop Comp | Limit effective for the month of December beginning December 1, 2023. |
| Nitrogen, Nitrite + Nitrate Total | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring section below. |
| Nitrogen, Total Kjeldahl | | mg/L | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annual in rotating quarters. See Nitrogen Series Monitoring section below. |
| Nitrogen, Total | | mg/L | See Listed Qtr(s) | Calculated | Annual in rotating quarters. See Nitrogen Series Monitoring section below. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen. |

Changes from Previous Permit

Permit modification completed to correct an error in E. coli % Exceedance Sample Frequency. The permit was reissued with 'Weekly'. This limit is expressed at a 'Monthly' frequency. The Nitrogen series was listed incorrectly as a frequency of weekly and should be 'See Listed Qtr(s)'.

The TMDL-derived Phosphorus limits for this facility become effective during this permit term and have been included. New Monthly and Weekly Average Ammonia Nitrogen limits of 108 mg/L have been added for this permit term.

Fecal coliform monitoring and limits have been replaced with *Escherichia coli* (*E. coli*) monitoring and limits. *E. coli* monitoring is required at the permit effective date. An interim fecal coliform limit of 400 #/100 ml as a monthly geometric mean will apply from the permit effective date through the end of a compliance schedule. At the end of the compliance schedule, *E. coli* limits of 126 #/100 ml as a monthly geometric mean that may never be exceeded and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply.

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

Explanation of Limits and Monitoring Requirements

Please refer to the Water Quality Based Effluent Limits (WQBEL) memo prepared by Sarah Luck dated January 22, 2021 for the detailed calculations and explanation. *E. coli* was not included in the memo due to code revisions not going into effect until spring of 2020.

Note: Throughout this fact sheet all citations of administrative code, for example, s. NR 102.06, Wis. Adm. Code, will be referenced as s. NR 106.02, and reflect current Wisconsin Administrative Code.

Categorical Limits

BOD₅, Total Suspended Solids (TSS), pH, and Fecal Coliform – Standard municipal wastewater requirements for BOD₅, TSS, pH, and Fecal Coliform are included based on NR 210 ‘Sewage Treatment Works’ requirements for discharges to fish and aquatic life streams. Chapter NR 102 ‘Water Quality Standards for Surface Waters’ also specifies requirements for pH for fish and aquatic life streams.

Regulatory changes to s. NR 205.065, became effective September 1, 2016 and require limits in this permit to be expressed as weekly average and monthly average limits whenever practicable. These changes are based on 40 CFR 122.45(d).

Water Quality Based Limits and WET Requirements and Disinfection (if applicable)

Total Suspended Solids – Weekly average and monthly average mass limits for total suspended solids were required to comply with the Rock River TMDL and were derived consistent with the assumptions and requirements of the EPA-approved WLA for the Rock River. There are no changes proposed in current concentration limits. The treatment plant is easily meeting the mass limits (see limits below). The approved total suspended solids TMDL limits for this permittee are included in the following table, expressed as weekly average and monthly average effluents limits, and were already effective during the previous permit term:

| Month | Monthly Ave TSS Limit lbs/day | Weekly Ave TSS Limit lbs/day |
|-------|-------------------------------|------------------------------|
| Jan | 32 | 19 |
| Feb | 35 | 21 |
| March | 32 | 19 |
| April | 32 | 19 |
| May | 32 | 19 |
| June | 32 | 19 |
| July | 32 | 19 |
| Aug | 32 | 19 |
| Sept | 32 | 19 |
| Oct | 32 | 19 |
| Nov | 32 | 19 |
| Dec | 32 | 19 |

Total Phosphorus – Recent revisions to the administrative rules for phosphorus discharges took effect on December 1, 2010. Details may be found at: <http://dnr.wi.gov/topic/surfacewater/phosphorus.html>. Mass limits were calculated to comply with the Rock River TMDL and were derived consistent with the assumptions and requirements of the EPA-approved WLA for the Rock River. Limits for the permit were determined using the code changes and the provisions of the TMDL. For the reasons explained in the April 30, 2012 paper entitled ‘Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin’, WDNR has determined that it is impracticable to express the phosphorus WQBEL for the permittee as daily maximum or weekly average values. The final effluent mass limits for phosphorus are expressed as monthly averages and are effective starting April 1, 2023. The approved total phosphorus TMDL mass limits for this permittee are included in the following table below:

| Month | Monthly Ave TP Limit lbs/day |
|--------|------------------------------|
| Jan | 0.64 |
| Feb | 0.86 |
| March | 0.88 |
| April | 0.71 |
| May | 0.66 |
| June | 0.64 |
| July | 0.53 |
| August | 0.65 |
| Sept | 0.70 |
| Oct | 0.70 |
| Nov | 0.64 |
| Dec | 0.56 |

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.

*Permit Modification corrected Sampling Frequency for the % Exceedance calculated E. coli parameter from ‘Weekly’ to ‘Monthly’.

Ammonia – Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia.

Total Nitrogen Monitoring (NO₂+NO₃, TKN and Total N) – The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the “Guidance for Total Nitrogen Monitoring in Wastewater Permits” dated October 1, 2019. Annual tests

are scheduled in the following rotating quarters: **July – September 2021; October – December 2022; January – March 2023; April – June 2024; July – September 2025**

*Permit Modification corrected the Sample Frequency to ‘See Listed Qtr(s)’ which is the correct frequency to ensure proper eDMRs are created.

3 Septage Management - Proposed 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.

Sample Point Number: 990- SEPTAGE

Changes from Previous Permit:

None.

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 Total Phosphorus - TMDL Derived WQBELs for TP

The permittee shall comply with the TMDL (Total Maximum Daily Load) derived WQBELs (Water Quality Based Effluent Limits) for TP as specified.

| Required Action | Due Date |
|---|------------|
| Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41, Stats. 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. | 12/31/2021 |
| Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. | 06/30/2022 |
| Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. | 02/28/2023 |
| Achieve Compliance: The permittee shall achieve compliance with final TP WQBELs. | 03/31/2023 |

4.1.1 Explanation of Total Phosphorus – TMDL Derived WQBELs for TP

The Total Maximum Daily Load limits for Total Phosphorus become effective this permit term. The above schedule has the final actions the facility needs to complete to achieve compliance with the final limits.

4.2 Effluent Limitations for E. coli

The permittee shall comply with surface water limitations for E. coli as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification

| Required Action | Due Date |
|--|------------|
| <p>Status Update: The permittee shall submit information within the discharge monitoring report (DMR) comment section documenting the steps taken in preparation for properly monitoring and testing for E. coli including, but not limited to, selected test method and location of sampling.</p> | 05/21/2021 |
| <p>Operational Evaluation Report: The permittee shall prepare and submit an Operational Evaluation Report to the Department for review and approval. The report shall include an evaluation of collected effluent data and proposed operational improvements that will optimize efficacy of disinfection at the treatment plant during the period prior to complying with final E. coli limitations and, to the extent possible, enable compliance with the final E. coli limitations. The report shall include a plan and schedule for implementation of the operational improvements. These improvements shall occur as soon as possible, but not later than April 30, 2022. The report shall state whether the operational improvements are expected to result in compliance with the final E. coli limitations.</p> <p>The permittee shall implement the operational improvements in accordance with the approved plan and schedule specified in the Operational Evaluation Report and in no case later than April 30, 2022.</p> <p>If the Operational Evaluation Report concludes that the operational improvements are expected to result in compliance with the final E. coli limitations, the permittee shall comply with the final E. coli limitations by April 30, 2022 and the permittee is not required to comply with subsequent milestones identified below in this compliance schedule ('Submit Facility Plan', 'Final Plans and Specifications', 'Treatment Plant Upgrade to Meet Limitations', 'Construction Upgrade Progress Report', 'Complete Construction', 'Achieve Compliance').</p> <p>FACILITY PLAN - If the Operational Evaluation Report concludes that operational improvements alone are not expected to result in compliance with the final E. coli limitations, the permittee shall initiate development of a facility plan for meeting final E. coli limitations and comply with the remaining required actions in this schedule of compliance.</p> <p>If the Department disagrees with the conclusion of the report, and determines that the permittee can achieve final E. coli limitations using the existing treatment system with only operational improvements, the Department may reopen and modify the permit to include an implementation schedule for achieving the final E. coli limitations sooner than April 30, 2025.</p> | 11/30/2021 |
| <p>Submit Facility Plan: If the Operational Evaluation Report concluded that the permittee cannot achieve final E. coli limitations with operational improvements alone, the permittee shall submit a Facility Plan per s. NR 110.09, Wis. Adm. Code. The permittee may submit an abbreviated facility plan if the Department determines that the modifications are minor.</p> | 04/30/2022 |
| <p>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 achieve compliance with final E. coli limitations and a schedule for completing construction of the upgrades by the complete construction date specified below.</p> | 03/31/2023 |
| <p>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.</p> | 09/30/2023 |

| | |
|---|------------|
| Construction Upgrade Progress Report: The permittee shall submit a progress report on construction upgrades. | 09/30/2024 |
| Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. | 03/31/2025 |
| Achieve Compliance: The permittee shall achieve compliance with final E. coli limitations. | 04/30/2025 |

4.2.1 Explanation of Effluent Limitations for E. Coli

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

Attachments:

Substantial Compliance Determination

Map(s)

Water Quality Based Effluent Limits

Public Notice

Proposed Expiration Date:

A permit term of five years is proposed in this reissuance with an expiration date of March 31, 2026.

Justification of Any Waivers from Permit Application Requirements

No waivers were requested from permit application requirements.

Prepared By:

Sean Spencer – Wastewater Specialist

Date: 3/22/2021

cc: Doris Thiele

Modification Prepared by: Jennifer Jerich, Wastewater Specialist

Dated: 4/5/2024