

Permit Fact Sheet

General Information

| | |
|---------------------------------------|---|
| Permit Number | WI-0022489-11-0 |
| Permittee Name and Address | CITY OF FORT ATKINSON 101 North Main Street Fort Atkinson WI 53538 |
| Permitted Facility Name and Address | Fort Atkinson Wastewater Treatment Facility 1600 FARMCO LANE, FORT ATKINSON, WISCONSIN |
| Permit Term | July 01, 2025 to June 30, 2030 |
| Discharge Location | East bank of the Rock River, SW ¼ of SE ¼ Section 8, T5N, R14E. Lat: 42.9054°N / Lon: 88.86633°W |
| Receiving Water | Rock River (Lower Koshkonong Creek Watershed, LR11 – Lower Rock River Basin) in Jefferson County |
| Stream Flow (Q _{7,10}) | 53 cfs |
| Stream Classification | Warm Water Sport Fish (WWSF), non-public water supply |
| Discharge Type | Existing, Continuous |
| Annual Average Design Flow (MGD) | 2.7 MGD |
| Industrial or Commercial Contributors | Jones Dairy Farm and Jones Dairy Farm South, Ball Corporation, Spacesaver Corporation, OSI Group, Fireside Restaurant, Fort HealthCare, Fort Atkinson High School |
| 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 City of Fort Atkinson operates a wastewater treatment facility (WWTF) providing secondary treatment for a combination of domestic, commercial, and industrial wastewater. The facility is an activated sludge plant. Processes include perforated plate screens, raw wastewater pumping, grit removal, primary clarification, activated sludge aeration basins, secondary clarification, tertiary disk filters for phosphorus removal, and chlorine disinfection. Primary and secondary sludge are aerobically digested in three aerobic digesters. Secondary sludge is thickened prior to digestion with a gravity belt thickener. After digestion the sludge is further dewatered with a centrifuge. Solids are stored on a covered pad until land application on area farm sites. Treated effluent is discharged via outfall 001 to the Rock River.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land application reports, compliance schedule items, and a site visit on August 24, 2023, 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 | 2.3 MGD (July 2019 – December 2024 Average) | Influent: 24-hr flow proportional composite samples collected prior to grit removal and recycle flow. A magnetic flow meter is located near the influent pumps. |
| 001 | N/A – Not required to report during previous permit term | Effluent: 24-hr flow proportional composite sample collected at the end of the disinfection tank, prior to discharge to the Rock River. During the months of December-February 24-hr flow proportional composite sample is collected at the end of tertiary filters in the tertiary filter building. Grab samples are collected at the same location the composite sampler pulls from. A Parshall flume with ultrasonic flow meter is located at the head of the disinfection tank. |
| 003 | 600 dry U.S. tons (2023 Permit Application) | Aerobically digested, Class B, Gravity Belt Thickened, Centrifuged Cake sludge. Representative sludge samples shall be collected from the cake sludge storage pad. |
| 005 | 156,500 Gallons – Hauled by permitted entity (2024 Total) | Aerobically digested, Class B, Liquid sludge. Representative sludge samples shall be collected from the discharge pipe of the final (third stage) aerobic digester. INACTIVE: DEPARTMENT APPROVAL REQUIRED TO ACTIVATE OUTFALL 005 MUST BE RECEIVED PRIOR TO USE. |
| 111 | N/A – Not required to report | In-Plant Monitoring: Collect the mercury field blank using standard sample handling procedures. |

Permit Requirements

1 Influent – Monitoring Requirements

1.1 Sample Point Number: 701- INFLUENT

| Monitoring Requirements and Limitations | | | | | |
|---|------------|-----------------|------------------|----------------------|-------|
| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
| Flow Rate | | MGD | Daily | Continuous | |
| BOD5, Total | | mg/L | 5/Week | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | | mg/L | 5/Week | 24-Hr Flow Prop Comp | |
| Mercury, Total Recoverable | | ng/L | Quarterly | 24-Hr Flow Prop Comp | |

1.1.1 Changes from Previous Permit:

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

1.1.2 Explanation of Limits and Monitoring Requirements

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

2 Inplant - Monitoring and Limitations

2.1 Sample Point Number: 111- GEN PLANT (Hg blank)

| Monitoring Requirements and Limitations | | | | | |
|---|------------|-----------------|------------------|-------------|-------|
| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
| Mercury, Total Recoverable | | ng/L | Quarterly | Blank | |

2.1.1 Changes from Previous Permit:

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

2.1.2 Explanation of Limits and Monitoring Requirements

Mercury Field Blank: Monitoring is included in the permit pursuant to s. NR 106.145, Wis. Adm. Code. Field blanks must meet the requirements under s. NR 106.145(9) and (10), Wis. Adm. Code. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of influent, effluent or other samples all collected on the same day). Field blanks are required to verify a sample has not been contaminated during collection, transportation or analysis.

3 Surface Water - Monitoring and Limitations

3.1 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 | 5/Week | 24-Hr Flow Prop Comp | |
| BOD5, Total | Monthly Avg | 30 mg/L | 5/Week | 24-Hr Flow Prop Comp | |
| Suspended Solids, | Weekly Avg | 45 mg/L | 5/Week | 24-Hr Flow | |

| Monitoring Requirements and Limitations | | | | | |
|---|--------------------------|-----------------|------------------|----------------------|--|
| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
| Total | | | | Prop Comp | |
| Suspended Solids, Total | Monthly Avg | 30 mg/L | 5/Week | 24-Hr Flow Prop Comp | |
| Suspended Solids, Total | Weekly Avg | 870 lbs/day | 5/Week | Calculated | January, March, May, July, August, October, December |
| Suspended Solids, Total | Weekly Avg | 966 lbs/day | 5/Week | Calculated | February |
| Suspended Solids, Total | Weekly Avg | 902 lbs/day | 5/Week | Calculated | April, June, September, November |
| Suspended Solids, Total | Monthly Avg | 587 lbs/day | 5/Week | Calculated | |
| pH Field | Daily Max | 9.0 su | 5/Week | Grab | |
| pH Field | Daily Min | 6.0 su | 5/Week | Grab | |
| Nitrogen, Ammonia (NH3-N) Total | Daily Max | 14 mg/L | 5/Week | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia (NH3-N) Total | Weekly Avg | 14 mg/L | 5/Week | 24-Hr Flow Prop Comp | |
| Nitrogen, Ammonia (NH3-N) Total | Monthly Avg | 14 mg/L | 5/Week | 24-Hr Flow Prop Comp | |
| E. coli | Geometric Mean - Monthly | 126 #/100 ml | 2/Week | Grab | May-September |
| E. coli | % Exceedance | 10 Percent | Monthly | Calculated | May-September |
| Chlorine, Total Residual | Daily Max | 38 ug/L | Daily | Grab | May-September |
| Chlorine, Total Residual | Weekly Avg | 30 ug/L | Daily | Grab | May-September |
| Chlorine, Total Residual | Monthly Avg | 30 ug/L | Daily | Grab | May-September |
| Phosphorus, Total | Monthly Avg | 1.0 mg/L | 5/Week | 24-Hr Flow Prop Comp | |
| Phosphorus, Total | Monthly Avg | 13.7 lbs/day | 5/Week | Calculated | January |
| Phosphorus, Total | Monthly Avg | 18.7 lbs/day | 5/Week | Calculated | February, March, April, May, June |
| Phosphorus, Total | Monthly Avg | 16.2 lbs/day | 5/Week | Calculated | July |

| Monitoring Requirements and Limitations | | | | | |
|--|-------------------|------------------------|-------------------------|----------------------|--|
| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
| Phosphorus, Total | Monthly Avg | 12.8 lbs/day | 5/Week | Calculated | August |
| Phosphorus, Total | Monthly Avg | 11.2 lbs/day | 5/Week | Calculated | September |
| Phosphorus, Total | Monthly Avg | 10.4 lbs/day | 5/Week | Calculated | October |
| Phosphorus, Total | Monthly Avg | 10.6 lbs/day | 5/Week | Calculated | November |
| Phosphorus, Total | Monthly Avg | 11.5 lbs/day | 5/Week | Calculated | December |
| Mercury, Total Recoverable | | ng/L | Quarterly | Grab | |
| Temperature Maximum | | deg F | Daily | Continuous | Monitoring in 2029. |
| Chloride | | mg/L | Monthly | 24-Hr Flow Prop Comp | Monitoring in 2029. |
| PFOS | | ng/L | 1/ 2 Months | Grab | Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule. |
| PFOA | | ng/L | 1/ 2 Months | Grab | Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule. |
| Nitrogen, Total Kjeldahl | | mg/L | Quarterly | 24-Hr Flow Prop Comp | |
| Nitrogen, Nitrite + Nitrate Total | | mg/L | Quarterly | 24-Hr Flow Prop Comp | |
| Nitrogen, Total | | mg/L | Quarterly | Calculated | Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen. |
| Acute WET | Daily Max | 1.0 TUa | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annually in rotating quarters. See WET Monitoring section for sample dates and WET requirements. |
| Chronic WET | Monthly Avg | 4.2 TUc | See Listed Qtr(s) | 24-Hr Flow Prop Comp | Annually in rotating quarters. See WET Monitoring section for sample dates and WET requirements. |

3.1.1 Changes from Previous Permit

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

Flow: Monitoring effluent flow rate is included in the permit.

TSS: The monthly average limit has been updated in accordance with WQT Plan No. WQT-2024-0030.

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

Phosphorus: The monthly average limit for February, March, April, May, and June have been updated in accordance with WQT Plan No. WQT-2024-0030.

Temperature: The sample frequency has changed to ‘Daily’ for eDMR reporting purposes. The year in which monitoring occurs has been updated to 2029.

Chloride: Monthly monitoring in 2029 is included in the permit.

PFOS and PFOA: Monitoring once every two months is included in the permit in accordance with s. NR 106.98(2)(b), Wis. Adm. Code.

Chronic WET: A monthly average limit is included in the permit.

3.1.2 Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo for the Fort Atkinson Wastewater Treatment Facility dated February 12, 2025, prepared by Sarah Luck, and used for this reissuance.

Total Suspended Solids and Phosphorus: The Department developed a TMDL for the Upper and Lower Rock River Basins. The U.S. EPA approved the Rock River TMDL on September 28, 2011. The Rock River TMDL includes wasteload allocations (WLA) for total suspended solids (TSS) and total phosphorus. The City of Fort Atkinson wastewater treatment facility is trading TMDL-derived TSS and total phosphorus load allocation to the City of Fort Atkinson’s storm water quality management system (MS4). This is reflected in lower load allocations given to Fort Atkinson WWTF for this permit term. Details can be found in Water Quality Trading Plan No. WQT-2024-0030.

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.

PFOS and PFOA: NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for major municipal dischargers with an average flow rate greater than 1 MGD but less than 5 MGD, at a minimum sample effluent once every two-months for PFOS and PFOA pursuant s. NR 106.98(2)(b), Wis. Adm. Code.

A sample frequency of 1/2 months means one sample is taken during any two-month period. Examples of 1/2 month sample would be every other month (Jan, March, May, etc.) or back-to-back months with a break in between (February & March, May & June, Aug & Sept, etc.). DMR Short Forms will be generated for the following time periods: January-February, March-April, May-June, July-August, September-October, and November-December. At a minimum one sample result will be present on each form.

The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code.

Total Nitrogen Monitoring (NO₂+NO₃, TKN and Total N): The 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.

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.

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.

4 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) |
| 003 | B | Cake | Fecal Coliform | Volatile Solids Reduction | Land Application | 600 |
| 005 | B | Liquid | Fecal Coliform | Volatile Solids Reduction | Land Application | None Anticipated – back up outfall only |
| 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. | | | | | | |

4.1 Sample Point Number: 003- SLUDGE and 005- Liquid Sludge Outfall Backup

Monitoring Requirements and Limitations

| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
|----------------------------------|-------------------|------------------------|-------------------------|--------------------|--|
| Solids, Total | | Percent | Quarterly | Composite | |
| Arsenic Dry Wt | Ceiling | 75 mg/kg | Quarterly | Composite | |
| Arsenic Dry Wt | High Quality | 41 mg/kg | Quarterly | Composite | |
| Cadmium Dry Wt | Ceiling | 85 mg/kg | Quarterly | Composite | |
| Cadmium Dry Wt | High Quality | 39 mg/kg | Quarterly | Composite | |
| Copper Dry Wt | Ceiling | 4,300 mg/kg | Quarterly | Composite | |
| Copper Dry Wt | High Quality | 1,500 mg/kg | Quarterly | Composite | |
| Lead Dry Wt | Ceiling | 840 mg/kg | Quarterly | Composite | |
| Lead Dry Wt | High Quality | 300 mg/kg | Quarterly | Composite | |
| Mercury Dry Wt | Ceiling | 57 mg/kg | Quarterly | Composite | |
| Mercury Dry Wt | High Quality | 17 mg/kg | Quarterly | Composite | |
| Molybdenum Dry Wt | Ceiling | 75 mg/kg | Quarterly | Composite | |
| Nickel Dry Wt | Ceiling | 420 mg/kg | Quarterly | Composite | |
| Nickel Dry Wt | High Quality | 420 mg/kg | Quarterly | Composite | |
| Selenium Dry Wt | Ceiling | 100 mg/kg | Quarterly | Composite | |
| Selenium Dry Wt | High Quality | 100 mg/kg | Quarterly | Composite | |
| Zinc Dry Wt | Ceiling | 7,500 mg/kg | Quarterly | Composite | |
| Zinc Dry Wt | High Quality | 2,800 mg/kg | Quarterly | Composite | |
| Nitrogen, Total Kjeldahl | | Percent | Quarterly | Composite | |
| Nitrogen, Ammonium (NH4-N) Total | | Percent | Quarterly | Composite | |
| Phosphorus, Total | | Percent | Quarterly | Composite | |
| Phosphorus, Water Extractable | | % of Tot P | Quarterly | Composite | |
| Potassium, Total Recoverable | | Percent | Quarterly | Composite | |
| Radium 226 Dry Wt | | pCi/g | Annual | Composite | |
| PCB Total Dry Wt | Ceiling | 50 mg/kg | Once | Composite | Monitoring in 2026. |
| PCB Total Dry Wt | High Quality | 10 mg/kg | Once | Composite | Monitoring in 2026. |
| PFOA + PFOS | | ug/kg | Annual | Calculated | Report the sum of PFOA and PFOS. See PFAS Permit Sections for more |

| Monitoring Requirements and Limitations | | | | | |
|---|------------|-----------------|------------------|-------------|--|
| Parameter | Limit Type | Limit and Units | Sample Frequency | Sample Type | Notes |
| | | | | | information. |
| PFAS Dry Wt | | | Annual | Grab | Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information. |

4.1.1 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.

4.1.2 Explanation of Limits and Monitoring Requirements

Requirements for disposal, including land application of municipal sludge, are determined in accordance with ch. NR 204, Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5), 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 is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFAS.”

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

5 Schedules

5.1 Mercury Pollutant Minimization Plan

| Required Action | Due Date |
|---|------------|
| Final Mercury Report: Submit a report summarizing the mercury pollutant minimization measures implemented during the current permit term and the success in maintaining effluent quality at or below the current concentrations. The report shall include an analysis of trends in quarterly and annual average mercury concentrations and total mass discharge of mercury based on mercury sampling and flow data covering the current permit term. The report shall also include analysis of how influent and effluent mercury varies with time and with significant loadings of mercury such as loads from industries or collection system maintenance. | 06/30/2030 |

5.1.1 Explanation of Schedule

The permittee shall continue to maintain effluent quality at or below the current effluent concentrations, continue to implement the mercury pollutant minimization plan, and perform the actions listed in the schedule.

5.2 PFOS/PFOA Minimization Plan Determination of Need

| Required Action | Due Date |
|---|------------|
| <p>Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code.</p> <p>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.</p> | 06/30/2026 |
| <p>Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan.</p> <p>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.</p> <p>The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan.</p> <p>If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued.</p> <p>If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.</p> | 06/30/2027 |

5.2.1 Explanation of Schedule

As stated above, ch. NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. Section NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge.

If the Department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

5.3 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 |

5.3.1 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 date February 12, 2025

Water Quality Trade Plan Approval Letter dated December 18, 2024

Water Quality Trade Plan No. WQT-2024-0030, dated September 2022

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: 03/18/2025

CORRESPONDENCE/MEMORANDUM

DATE: February 12, 2025

TO: BetsyJo Howe – SCR/Fitchburg

FROM: Sarah Luck – SCR/Fitchburg

SUBJECT: Water Quality-Based Effluent Limitations for the Fort Atkinson Wastewater Treatment Facility
 WPDES Permit No. WI-0022489-11-0

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 Fort Atkinson Wastewater Treatment Facility in Jefferson County. This municipal wastewater treatment facility (WWTF) discharges to the Rock River, located in the Lower Koshkonong Creek Watershed (LR11) in the Lower Rock River Basin. This discharge is included in the Rock River TMDL as approved by EPA. 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 |
| BOD ₅ | | | 45 mg/L | 30 mg/L | 2 |
| TSS | | | 45 mg/L | 30 mg/L | 3 |
| pH | 9.0 s.u. | 6.0 s.u. | | | 2 |
| Ammonia Nitrogen | 14 mg/L | | 14 mg/L | 14 mg/L | 2,4 |
| <i>E. coli</i> May – September | | | | 126 #/100 mL geometric mean | 5 |
| Residual Chlorine | 38 µg/L | | 30 µg/L | 30 µg/L | 2,4 |
| Chloride | | | | | 6 |
| Mercury | | | | | 7 |
| PFOS and PFOA | | | | | 8 |
| Phosphorus | | | | 1.0 mg/L | 3,9 |
| TKN, Nitrate+Nitrite, and Total Nitrogen | | | | | 10 |
| Temperature, Maximum | | | | | 11 |
| Acute WET | 1.0 TU _a | | | | 12,14 |
| Chronic WET | | | | 4.2 TU _c | 13,14 |

Footnotes:

1. Monitoring only.
2. No changes from the current permit.

3. Additional phosphorus and TSS mass limitations are required in accordance with the wasteload allocations specified in the Rock River TMDL. However, some of the limits have been adjusted (reduced) as part of a water quality trading plan with the City of Fort Atkinson's MS4 program.

| Month | Monthly Ave TSS Effluent Limit (lbs/day) | Weekly Ave TSS Effluent Limit (lbs/day) | Monthly Ave TP Effluent Limit (lbs/day) |
|-----------|--|---|---|
| January | 587 | 870 | 13.7 |
| February | 587 | 966 | 18.7 |
| March | 587 | 870 | 18.7 |
| April | 587 | 902 | 18.7 |
| May | 587 | 870 | 18.7 |
| June | 587 | 902 | 18.7 |
| July | 587 | 870 | 16.2 |
| August | 587 | 870 | 12.8 |
| September | 587 | 902 | 11.2 |
| October | 587 | 870 | 10.4 |
| November | 587 | 902 | 10.6 |
| December | 587 | 870 | 11.5 |

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. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
6. Monitoring at a frequency to ensure that a minimum of 11 samples are available at the next permit issuance.
7. Quarterly monitoring throughout the permit term. Pollutant minimization efforts are recommended to continue during the reissued permit term in order to maintain effluent quality at or below current levels.
8. PFOS and PFOA monitoring is recommended at a frequency of once every two months in accordance with s. NR 106.98(2), Wis. Adm. Code.
9. The concentration limit is a technology-based limit as described in subch. II of NR 217, Wis. Adm. Code, and is retained to prevent backsliding.
10. As recommended in the Department's October 1, 2019 *Guidance for Total Nitrogen Monitoring in Wastewater Permits*, quarterly total nitrogen monitoring is recommended for all municipal major permittees. Total Nitrogen is the sum of nitrate (NO₃), nitrite (NO₂), and total Kjeldahl nitrogen (TKN) (all expressed as N).
11. Monitoring for one year in the fourth year of the permit term.
12. Annual acute WET monitoring is required. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests.
13. Annual chronic WET monitoring is required. The Instream Waste Concentration (IWC) to assess chronic test results is 24%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 30%, 10%, 3% & 1%, and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the Rock River.
14. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Sarah Luck (Sarah.Luck@wisconsin.gov) or Diane Figiel (Diane.Figiel@wisconsin.gov).

Attachments (4) – Narrative, Site Map, Ammonia Nitrogen Calculations, and Thermal Table

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**Water Quality-Based Effluent Limitations for
Fort Atkinson Wastewater Treatment Facility**

WPDES Permit No. WI-22489-11-0

PART 1 – BACKGROUND INFORMATION

Facility Description

The City of Fort Atkinson operates a wastewater treatment facility (WWTF) providing secondary treatment for a combination of domestic, commercial, and industrial wastewater. Industrial and commercial discharge is from Jones Dairy Farm, On-Cor Frozen Foods, McCain Foods, Ball Corp., Spacesaver, Fireside Restaurant, Fort HealthCare, and Fort Atkinson High School. The facility is an activated sludge plant. Processes include sewage grinders, raw wastewater pumping, grit removal, primary clarification, activated sludge aeration basins, secondary clarification, tertiary disk filters for phosphorus removal, and chlorine disinfection. Primary and secondary sludge are aerobically digested in three aerobic digesters. Secondary sludge is thickened prior to digestion with a gravity belt thickener. After digestion the sludge is further dewatered with a centrifuge. Solids are stored on a covered pad until land application on area farm sites. Treated water is discharged via outfall 001 to the Rock River at an annual average design flow of 2.7 MGD.

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

Existing Permit Limitations

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

| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Footnotes |
|--|---------------------|---------------|---------------------------------------|-------------------------------|-----------|
| BOD ₅ | | | 45 mg/L | 30 mg/L | 1 |
| TSS | | | 45 mg/L | 30 mg/L | 1,2 |
| pH | 9.0 s.u. | 6.0 s.u. | | | 1 |
| Ammonia Nitrogen | 14 mg/L | | 14 mg/L | 14 mg/L | 3 |
| Fecal Coliform May – September | | | 780#/100 mL geometric mean | 400#/100 mL geometric mean | 3 |
| Residual Chlorine | 38 µg/L | | 30 µg/L | 30 µg/L | 3 |
| Mercury | | | | | 4 |
| Phosphorus Interim Final | | | | 1.5 mg/L 1.0 mg/L | 5 |
| TKN, Nitrate+Nitrite, and Total Nitrogen | | | | | 4 |
| Temperature | | | | | 4 |
| Acute WET | 1.0 TU _a | | | | 6 |

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| Parameter | Daily Maximum | Daily Minimum | Weekly Average | Monthly Average | Footnotes |
|-------------|---------------|---------------|----------------|-----------------|-----------|
| Chronic WET | | | | | 6 |

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. Additional phosphorus and TSS mass limitations are required in accordance with the waste load allocations specified in the Rock River TMDL.

| Month | Monthly Ave TSS Effluent Limit (lbs/day) | Weekly Ave TSS Effluent Limit (lbs/day) | Monthly Ave TP Effluent Limit (lbs/day) |
|-----------|--|---|---|
| January | 659 | 870 | 13.7 |
| February | 732 | 966 | 19.5 |
| March | 659 | 870 | 20.7 |
| April | 683 | 902 | 23.5 |
| May | 659 | 870 | 22.4 |
| June | 683 | 902 | 20.8 |
| July | 659 | 870 | 16.2 |
| August | 659 | 870 | 12.8 |
| September | 683 | 902 | 11.2 |
| October | 659 | 870 | 10.4 |
| November | 683 | 902 | 10.6 |
| December | 659 | 870 | 11.5 |

3. 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.
4. Monitoring only.
5. The alternate phosphorus limit of 1.5 mg/L was effective through June 30, 2023, and the TMDL mass limits and the concentration limit of 1.0 mg/L became effective July 1, 2023.
6. Annual acute and chronic WET testing. The IWC for chronic WET was 24%.

Receiving Water Information

- Name: Rock River
- Waterbody Identification Code (WBIC): 788800
- 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-Q₁₀ and 7-Q₂ values are from USGS at the station located at Highway 12 in Fort Atkinson.
 - 7-Q₁₀ = 53 cfs (cubic feet per second)
 - 7-Q₂ = 200 cfs
 - 90-Q₁₀ = 170 cfs
 - Harmonic Mean Flow = 325 cfs
- Hardness = 285 mg/L as CaCO₃. This value represents the geometric mean of eight WET tests performed by Fort Atkinson Wastewater Treatment Facility from October 2019 through April 2024.
- % 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 Rock River (Waupun Site #45 from

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Chapter 4 of the Great Lakes Water Quality Initiative (GLI) Rules Implementation Procedure guidance document) is used for this evaluation. The numerical values are shown in the tables below. Chloride data measured from the Rock River at the Milwaukee Street Bridge in Watertown (SWIMS Station #283220) from 07/15/14 to 12/17/18 is used as a background concentration for chloride. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations.

- Multiple dischargers: There are several other dischargers to the Rock 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 Rock River is listed as impaired for phosphorus and total suspended solids at the point of discharge. An EPA-approved TMDL addresses the phosphorus and total suspended solids impairments in this waterbody and downstream waters.

Effluent Information

- Flow rate:
 Design annual average = 2.7 MGD (Million Gallons per Day)
 For reference, the actual average flow from July 2019 through December 2024 was 2.3 MGD.
- Hardness = 370 mg/L as CaCO₃. This value represents the geometric mean of four samples collected during January and February 2023 reported on 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).
- Wastewater sources: Domestic and commercial wastewater with industrial sources from Spacesaver Corporation, Ball Corporation, OSI Foods, and Jones Dairy Farm.
- Water supply: City of Fort Atkinson water utility.
- Additives: Sodium hypochlorite (disinfection), sodium bisulfite (dechlorination), and ferric chloride (phosphorus removal). The facility also listed Aquabac XT (midge fly control) and Aquachem EM 1585 (sludge dewatering) on their permit application. Aquabac XT has been known to cause toxicity if it enters the surface water, and in correspondence with the facility on 02/03/25, the facility noted that Aquabac XT is rarely used and will possibly be discontinued in the future. When Aquabac XT is added, it is added at the aeration splitter box which is ahead of final clarification and ultrafiltration.
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the “priority pollutants” except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code, plus chloride and copper. The permit-required monitoring for mercury is used in this evaluation.
- 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.

Copper Effluent Data

| Sample Date | Copper (µg/L) | Sample Date | Copper (µg/L) | Sample Date | Copper (µg/L) |
|---------------------------------|---------------|-------------|---------------|-------------|---------------|
| 01/24/2023 | 5.2 | 02/12/2023 | 5.4 | 03/02/2023 | 12 |
| 01/29/2023 | 9.8 | 02/16/2023 | 6.2 | 03/06/2023 | 4.2 |
| 02/02/2023 | 6.5 | 02/20/2023 | 4.1 | 04/03/2023 | 4.0 |
| 02/06/2023 | 6.1 | 02/26/2023 | 9.3 | | |
| 1-day P ₉₉ = 15 µg/L | | | | | |
| 4-day P ₉₉ = 10 µg/L | | | | | |

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Chloride Effluent Data

| Sample Date | Chloride (mg/L) |
|-------------|-----------------|
| 01/24/2023 | 570 |
| 01/29/2023 | 610 |
| 02/02/2023 | 600 |
| 02/06/2023 | 500 |
| Average | 570 |

Mercury Effluent Data

| | Mercury (ng/L) |
|------------------------|-------------------------|
| 1-day P ₉₉ | 2.0 |
| 4-day P ₉₉ | 1.3 |
| 30-day P ₉₉ | 0.91 |
| Mean | 0.73 |
| Std | 0.38 |
| Sample size | 22 |
| Range | 0.25 - 1.7 |
| Sample dates | 08/06/2019 – 10/22/2024 |

The following table presents the average concentrations and loadings at Outfall 001 from July 2019 through December 2024 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Averages of Parameters with Limits

| | Average Measurement | Average Mass Discharged |
|-------------------|---------------------|-------------------------|
| BOD ₅ | 6 mg/L* | |
| TSS | 6 mg/L* | 112 lbs/day |
| pH field | 7.6 s.u. | |
| Phosphorus | 0.55 mg/L | 11 lbs/day |
| Ammonia Nitrogen | 0.40 mg/L* | |
| Fecal Coliform | 62#/100mL | |
| Residual Chlorine | <100 µg/L | |

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

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

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

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

Acute Limits based on 1-Q₁₀

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q₁₀ receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

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

Where:

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

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

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

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

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

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q₁₀ method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Fort Atkinson Wastewater Treatment Facility, and the limits are set based on two times the acute toxicity criteria (2×ATC).

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

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 42 cfs, (1-Q₁₀ (estimated as 80% of 7-Q₁₀)), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

| SUBSTANCE | REF. HARD.* mg/L | ATC | MAX. EFFL. LIMIT** | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 1-day P ₉₉ | 1-day MAX. CONC. |
|----------------|---------------------|------|--------------------|--------------------|------------------|-----------------------|------------------|
| Chlorine | | 19.0 | 38.1 | 7.61 | <100 | | |
| Arsenic | | 340 | 679.6 | 135.9 | <1.1 | | |
| Cadmium | 370 | 46.2 | 92.4 | 18.5 | <0.19 | | |
| Chromium | 301 | 4446 | 8891.7 | 1778 | 1.2 | | |
| Copper | 370 | 53.3 | 106.6 | | | 15 | 12 |
| Lead | 356 | 365 | 729.3 | 145.9 | <4.3 | | |
| Mercury (ng/L) | | 830 | 1660 | | | 2.0 | 1.7 |
| Nickel | 268 | 1080 | 2160.6 | 432 | 1.8 | | |
| Zinc | 333 | 345 | 689.4 | 137.9 | 22 | | |

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| 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. |
|-----------------|---------------------|-----|--------------------|--------------------|------------------|-----------------------|------------------|
| Chloride (mg/L) | | 757 | 1514.0 | 303 | 570*** | | |

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

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

*** See chloride discussion below tables.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 13 cfs (¼ of the 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

| SUBSTANCE | REF. HARD.* mg/L | CTC | MEAN BACK-GRD. | WEEKLY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 4-day P ₉₉ |
|-----------------|---------------------|--------|----------------|-------------------|--------------------|------------------|-----------------------|
| Chlorine | | 7.28 | | 30.37 | 6.07 | <100 | |
| Arsenic | | 152.2 | | 635 | 127.0 | <1.1 | |
| Cadmium | 175 | 3.82 | | 15.94 | 3.2 | <0.19 | |
| Chromium | 285 | 311.89 | 0.02 | 1301 | 260.2 | 1.2 | |
| Copper | 285 | 25.39 | 1.23 | 102.0 | | | 10 |
| Lead | 285 | 77.16 | 0.37 | 320.7 | 64.1 | <4.3 | |
| Mercury (ng/L) | | 440 | 4.74 | 1820 | | | 1.3 |
| Nickel | 268 | 120.18 | | 501 | 100.3 | 1.8 | |
| Zinc | 285 | 301.22 | 1.9 | 1251 | 250.1 | 22 | |
| Chloride (mg/L) | | 395 | 62.4 | 1450 | 290.0 | 570** | |

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

** See chloride discussion below tables.

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 43 cfs (¼ of the 90-Q₁₀), as specified in s. NR 106.06(4), Wis. Adm. Code

| SUBSTANCE | WC | MEAN BACK-GRD. | MO'LY AVE. LIMIT | 1/5 OF EFFL. LIMIT | 30-day P ₉₉ |
|----------------|-----|----------------|------------------|--------------------|------------------------|
| Mercury (ng/L) | 1.3 | 4.74 | 1.3 | | 0.91 |

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 81 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. | 30-day P ₉₉ |
|----------------|---------|----------------|------------------|--------------------|------------------|------------------------|
| Cadmium | 370 | | 7566 | 1513.2 | <0.19 | |
| Chromium (+3) | 3818000 | 0.02 | 78073681 | 15614736 | 1.2 | |
| Lead | 140 | 0.37 | 2856 | 571.1 | <4.3 | |
| Mercury (ng/L) | 1.5 | 4.74 | 1.5 | | | 0.91 |

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| SUBSTANCE | HTC | MEAN BACK-GRD. | MO'LY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. | 30-day P ₉₉ |
|-------------------|-------|----------------|------------------|--------------------|------------------|------------------------|
| Nickel | 43000 | | 879300 | 175860 | 1.8 | |
| Cyanide, Total | 9300 | | 190174 | 38035 | 18 | |
| Diethyl Phthalate | 68000 | | 1390521 | 278104 | 17 | |

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 81 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

| SUBSTANCE | HCC | MO'LY AVE. LIMIT | 1/5 OF EFFL. LIMIT | MEAN EFFL. CONC. |
|------------|------|------------------|--------------------|------------------|
| Arsenic | 13.3 | 272.0 | 54.39 | <1.1 |
| Chloroform | 1960 | 40080 | 8016 | 0.28 |

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

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, **no effluent limitations are required.**

Total Residual Chlorine – Since chlorine is added as a disinfectant, effluent limitations are recommended to assure proper operation of the de-chlorination system. Section NR 210.06(2)(b), Wis. Adm. Code, states, “When chlorine is used for disinfection, the daily maximum total residual chlorine concentration of the discharge may not exceed 0.10 mg/L.” Because the WQBELs are more restrictive, they are recommended instead. Specifically, **a daily maximum limit of 38 µg/L is required.** Due to revisions to s. NR 106.07(2), Wis. Adm. Code, mass limitations are no longer required. **The weekly average effluent limitation of 30 µg/L should be included in the permit** because it is more restrictive than the daily maximum limit. **A monthly average limit of 30 µg/L, equal to the weekly average limit, is also required** in accordance with s. NR 106.07(3), Wis. Adm. Code.

Chloride – Four chloride samples were collected in January and February 2023 as part of permit application sampling. The mean of these four samples (570 mg/L) exceeds both 1/5th of the acute and chronic toxicity criteria which is used to determine the need to include a limit per s. NR 106.05(6), Wis. Adm. Code. However, at the last permit issuance, 11 results were collected in 2017. The results from 2017 are still considered to be representative since there have been no changes in operations. All samples from 2017 and 2023 are shown in the table below.

Chloride Effluent Data

| Sample Date | Chloride (mg/L) | Sample Date | Chloride (mg/L) | Sample Date | Chloride (mg/L) |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 01/08/2017 | 429 | 06/19/2017 | 410 | 11/06/2017 | 212 |
| 02/06/2017 | 437 | 07/05/2017 | 356 | 01/24/2023 | 570 |
| 03/06/2017 | 420 | 08/02/2017 | 188 | 01/29/2023 | 610 |
| 04/10/2017 | 372 | 09/06/2017 | 446 | 02/02/2023 | 600 |

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| Sample Date | Chloride (mg/L) | Sample Date | Chloride (mg/L) | Sample Date | Chloride (mg/L) |
|----------------------------------|-----------------|-------------|-----------------|-------------|-----------------|
| 05/07/2017 | 309 | 10/06/2017 | 669 | 02/06/2023 | 500 |
| 1-day P ₉₉ = 858 mg/L | | | | | |
| 4-day P ₉₉ = 623 mg/L | | | | | |

Using the 1-day and 4-day P₉₉s above (858 mg/L and 623 mg/L, respectively), the 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 WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L. The current permit requires quarterly monitoring of the influent and effluent for total recoverable mercury. A total of 22 effluent sampling results are available from August 2019 through October 2024 for total recoverable mercury. The average concentration was 0.73 ng/L, and the maximum was 1.7 ng/L. Since the 30-day P₉₉ of available data (0.91 ng/L) is less than the most stringent WQBEL of 1.3 ng/L, **no limit for mercury is required for permit reissuance. Quarterly total recoverable mercury monitoring is recommended, as well as continuation of pollutant minimization efforts** in order to maintain effluent quality at or below current levels.

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 effluent flow rate, **PFOS and PFOA monitoring is recommended at a once every two months frequency.**

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

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:

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

Where:

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

The effluent pH data was examined as part of this evaluation. A total of 1437 sample results were reported from July 2019 through December 2024. The maximum reported value was 8.0 s.u. (Standard pH Units). The effluent pH was 7.9 s.u. or less 99% of the time. The 1-day P₉₉, calculated in accordance with s. NR 106.05(5), Wis. Adm. Code, is 8.0 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 8.0 s.u. Therefore, a value of 8.0 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 8.0 s.u. into the equation above yields an ATC = 8.41 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-Q₁₀ receiving water low flow or two times the acute toxicity criteria (2×ATC). The more restrictive calculated limits shall apply in order to be protective of the fish and aquatic life.

The calculated daily maximum ammonia nitrogen effluent limits using the mass balance approach with the 1-Q₁₀ (estimated as 80 % of 7-Q₁₀) and the 2×ATC approach are shown below.

Daily Maximum Ammonia Nitrogen Determination

| | Ammonia Nitrogen Limit mg/L |
|-------------------|-----------------------------|
| 2×ATC | 17 |
| 1-Q ₁₀ | 93 |

The 2×ATC method yields the most stringent limit for Fort Atkinson Wastewater Treatment Facility.

The limit of 17 mg/L, calculated above, is greater than the current daily maximum limit of 14 mg/L. If Fort Atkinson Wastewater Treatment Facility would like to request an increase to the existing permit limits an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter-by-parameter basis and includes consideration of operations, maintenance, and temporary upsets. **Without a demonstration of need for a higher limit in accordance with s. NR 207.04, Wis. Adm. Code, the current daily maximum limit of 14 mg/L must be continued in the reissued permit.**

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

Daily Maximum Ammonia Nitrogen Limits – WWSF

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

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

The weekly and monthly average ammonia nitrogen limits previously calculated do not change because there have been no changes in the effluent and receiving water flow rates. The calculations from the 2005 WQBEL memo are shown in Attachment #3.

Effluent Data

The following table evaluates the statistics based upon ammonia data reported from July 2019 through December 2024.

| Ammonia Nitrogen Effluent Data | |
|---------------------------------------|-------------------------|
| | Ammonia Nitrogen (mg/L) |
| 1-day P ₉₉ | 3.3 |
| 4-day P ₉₉ | 1.8 |
| 30-day P ₉₉ | 0.81 |
| Mean* | 0.40 |
| Std | 0.75 |
| Sample size | 1436 (64 ND) |
| Range | <0.053 - 11.4 |

“<” means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected (ND) results.

Reasonable Potential

The need to include ammonia limits in the Fort Atkinson Wastewater Treatment Facility permit is determined by calculating 99th upper percentile (or P₉₉) values for ammonia and comparing those to the calculated limits. Based on this comparison, there is no reasonable potential for the discharge to exceed any of the calculated ammonia nitrogen limits. However, since the permit currently has daily maximum, weekly average, and monthly average limits year-round, **the limits must be retained regardless of reasonable potential**, consistent with s. NR 106.33(1)(b), Wis. Adm. Code:

- (b) If a permittee is subject to an ammonia limitation in an existing permit, the limitation shall be included in any reissued permit. Ammonia limitations shall be included in the permit if the permitted facility will be providing treatment for ammonia discharges.

Conclusions and Recommendations

In summary, after rounding to two significant figures, the following ammonia nitrogen limitations are recommended. No mass limitations are recommended in accordance with s. NR 106.32(5), Wis. Adm Code.

| Final Ammonia Nitrogen Limits | | | |
|--------------------------------------|---------------|----------------|-----------------|
| | Daily Maximum | Weekly Average | Monthly Average |
| Year-round | 14 mg/L | 14 mg/L | 14 mg/L |

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

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. Since Fort Atkinson Wastewater Treatment Facility's permit requires twice 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

Fort Atkinson Wastewater Treatment Facility has monitored effluent *E. coli* from June through September 2023, and a total of 36 results are available. A geometric mean of 126 counts/100 mL was not exceeded in any of the months, and the maximum monthly geometric mean was 74 counts/100 mL. Effluent data did not show any exceedance of 410 counts/100 mL; the maximum reported value was 400 counts/100 mL. Based on the 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.

Since Fort Atkinson Wastewater Treatment Facility currently has a monthly average limit of 1.0 mg/L in effect, this limit should be included in the reissued permit. This limit remains applicable unless a more stringent WQBEL is given.

In addition, the need for a WQBEL for phosphorus must be considered.

TMDL Limits

The Department has developed a TMDL for the Upper and Lower Rock River Basins. The U.S. EPA approved the Rock River TMDL on September 28, 2011. The document, along with the referenced appendices can be found at: <https://dnr.wisconsin.gov/topic/TMDLs/RockRiver/index.html>.

Attachment #1

The monthly average total phosphorus effluent limits in pounds per day (lbs/day) are calculated based on the monthly phosphorus wasteload allocation (WLA) given in pounds per month as suggested in the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* dated April 15, 2013. The WLA for this facility is found in the *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin* report dated July 2011 in Appendix P: Monthly Total Phosphorus Allocations by Wastewater Treatment Facility.

Water Quality Trading

A water quality trading plan has been conditionally approved for Fort Atkinson Wastewater Treatment Facility. The wastewater treatment facility intends to apply excess reduction in total phosphorus and total suspended solids from the wastewater treatment facility to a portion of the City of Fort Atkinson’s storm water quality management system. The original Rock River TMDL allocations and the adjusted (post-trade agreement) allocations are shown in the table below. **The monthly average total phosphorus mass limits based on the trade agreement (denoted in bold text) are recommended for the reissued permit.**

TMDL Limits and Trade Agreement Limits for Total Phosphorus

| Month | TMDL WLA Monthly Ave Effluent Limit (lbs/day) | Trade Agreement Monthly Ave Effluent Limit (lbs/day) |
|-----------|---|--|
| January | 13.7 | 13.7 |
| February | 19.5 | 18.7 |
| March | 20.7 | 18.7 |
| April | 23.5 | 18.7 |
| May | 22.4 | 18.7 |
| June | 20.8 | 18.7 |
| July | 16.2 | 16.2 |
| August | 12.8 | 12.8 |
| September | 11.2 | 11.2 |
| October | 10.4 | 10.4 |
| November | 10.6 | 10.6 |
| December | 11.5 | 11.5 |

Water Quality-Based Effluent Limits (WQBEL)

Section NR 217.16, Wis. Adm. Code, states that the Department may include a TMDL-derived effluent limit for phosphorus in addition to, or in lieu of, a s. NR 217.13, Wis. Adm. Code, WQBEL in a WPDES permit. Since the Rock River Basin TMDL was developed to protect and improve the water quality of phosphorus-impaired waters within the basin, and since Fort Atkinson Wastewater Treatment Facility flows directly into the Rock River, which is classified as phosphorus-impaired, **the TMDL-based adjusted mass limits can be included in the WPDES permit absent the s. NR 217.13, Wis. Adm. Code, WQBEL limit.** If the Department determines the nonpoint source load allocation has not been substantially reduced, the Department may include the s. NR 217.13, Wis. Adm. Code, WQBEL unless these reductions are likely to occur.

Effluent Data

The tables below summarize effluent total phosphorus monitoring data from July 2019 through December 2024.

Overall Total Phosphorus Effluent Data

| | mg/L | lbs/day |
|------------------------|-------------|-----------|
| 1-day P ₉₉ | 2.35 | 46 |
| 4-day P ₉₉ | 1.31 | 26 |
| 30-day P ₉₉ | 0.78 | 15 |
| Mean | 0.55 | 11 |
| Std | 0.47 | 9.18 |
| Sample size | 1434 | 1434 |
| Range | 0.09 - 8.33 | 1.8 - 108 |

Total Phosphorus Effluent Mass Data by Month

| Data in lbs/day | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|------------------------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|
| 1-day P ₉₉ | 18 | 19 | 29 | 16 | 23 | 49 | 87 | 53 | 32 | 52 | 26 | 22 |
| 4-day P ₉₉ | 12 | 13 | 17 | 11 | 14 | 29 | 49 | 30 | 19 | 29 | 16 | 14 |
| 30-day P ₉₉ | 9.4 | 9.5 | 11 | 8.0 | 9.7 | 19 | 30 | 18 | 12 | 17 | 12 | 10 |
| Mean | 8.0 | 7.9 | 8.6 | 6.7 | 7.6 | 14 | 21 | 13 | 10 | 12 | 9.3 | 7.9 |
| Std | 3.0 | 3.4 | 5.8 | 2.8 | 4.4 | 9.5 | 18 | 11 | 6.1 | 10 | 4.9 | 4.2 |
| Sample size | 111 | 101 | 111 | 105 | 110 | 108 | 132 | 133 | 129 | 133 | 128 | 133 |
| Range | 2.7 - 14 | 2.3 - 16 | 2.0 - 35 | 2.2 - 14 | 2.4 - 33 | 4.5 - 60 | 4 - 108 | 2.0 - 53 | 2.0 - 31 | 2.5 - 65 | 1.8 - 20 | 2.4 - 18 |

PART 6 – TOTAL SUSPENDED SOLIDS**TMDL Limits**

The Department has developed a TMDL for the Upper and Lower Rock River Basins. The U.S. EPA approved the Rock River TMDL on September 28, 2011. The document, along with the referenced appendices, can be found at: <https://dnr.wisconsin.gov/topic/TMDLs/RockRiver/index.html>.

The Rock River TMDL includes wasteload allocations (WLA) for total suspended solids (TSS) which may be found in *Total Maximum Daily Loads for Total Phosphorus and Total Suspended Solids in the Rock River Basin* report dated July 2011 in Appendix Q: Monthly Total Suspended Solids Allocations by Wastewater Treatment Facility. The monthly average mass limits in pounds per day (lbs/day) are calculated based on the monthly phosphorus wasteload allocation (WLA), given in tons per month, divided by the number of days per month multiplied by a conversion factor of 2,000 lbs/ton. The weekly average mass limits are calculated by multiplying the monthly average limit by a multiplier. For Fort Atkinson Wastewater Treatment Facility, that multiplier was determined to be 1.32 from the *TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Programs* (dated April 15, 2013) based on a coefficient of variation of 0.6 and a sampling frequency of five times per week. **Since Fort Atkinson Wastewater Treatment Facility is currently meeting the WLA, the TSS mass limits do not need to be reevaluated at this time.**

Water Quality Trading

A water quality trading plan has been conditionally approved for Fort Atkinson Wastewater Treatment Facility. The wastewater treatment facility intends to apply excess reduction in TSS and total phosphorus from the wastewater treatment facility to a portion of the City of Fort Atkinson’s storm water quality management system. The original Rock River TMDL allocations and the adjusted (post-trade agreement) allocations are shown in the table on the next page. **The weekly and monthly average TSS mass limits based on the trade agreement (denoted in bold text) are recommended for the reissued permit.**

TMDL Limits and Trade Agreement Limits for TSS

| Month | TMDL WLA Monthly Ave TSS Effluent Limit (lbs/day) | TMDL WLA Weekly Ave TSS Effluent Limit (lbs/day) | Trade Agreement Monthly Ave TSS Effluent Limit (lbs/day) | Trade Agreement Weekly Ave TSS Effluent Limit (lbs/day) |
|-----------|---|--|--|---|
| January | 659 | 870 | 587 | 870 |
| February | 732 | 966 | 587 | 966 |
| March | 659 | 870 | 587 | 870 |
| April | 683 | 902 | 587 | 902 |
| May | 659 | 870 | 587 | 870 |
| June | 683 | 902 | 587 | 902 |
| July | 659 | 870 | 587 | 870 |
| August | 659 | 870 | 587 | 870 |
| September | 683 | 902 | 587 | 902 |
| October | 659 | 870 | 587 | 870 |
| November | 683 | 902 | 587 | 902 |
| December | 659 | 870 | 587 | 870 |

Effluent Data

The following tables summarize effluent TSS monitoring data from July 2019 through December 2024.

Overall TSS Effluent Data

| | mg/L | lbs/day |
|------------------------|---------------|---------|
| 1-day P ₉₉ | 21 | 480 |
| 4-day P ₉₉ | 13 | 274 |
| 30-day P ₉₉ | 8 | 169 |
| Mean | 6 | 123 |
| Std | 4.22 | 95.41 |
| Sample Size | 1437 (140 ND) | 1437 |
| Range | <2 - 30 | 0 - 526 |

“<” means that the pollutant was not detected at the indicated level of detection. The mean concentration was calculated using zero in place of the non-detected results.

TSS Effluent Mass Data by Month

| Data in lbs/day | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|------------------------|-----|-----|-----|-----|-----|------|------|-----|------|-----|-----|-----|
| 1-day P ₉₉ | 456 | 476 | 540 | 386 | 360 | 301 | 302 | 275 | 352 | 690 | 628 | 602 |
| 4-day P ₉₉ | 276 | 287 | 315 | 230 | 207 | 192 | 192 | 173 | 204 | 379 | 349 | 333 |
| 30-day P ₉₉ | 185 | 192 | 202 | 150 | 129 | 136 | 136 | 120 | 130 | 215 | 203 | 193 |

Attachment #1

| Data in lbs/day | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec |
|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Mean | 144 | 148 | 151 | 115 | 94 | 110 | 109 | 96 | 97 | 145 | 141 | 133 |
| Std | 88 | 92 | 106 | 75 | 71 | 56 | 57 | 52 | 69 | 140 | 127 | 122 |
| Sample size | 111 | 101 | 112 | 106 | 111 | 108 | 132 | 133 | 129 | 133 | 128 | 133 |
| Range | 0 - 370 | 0 - 332 | 0 - 467 | 0 - 258 | 0 - 255 | 0 - 259 | 0 - 341 | 0 - 285 | 0 - 292 | 0 - 521 | 0 - 526 | 0 - 508 |

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

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

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from July 2019 through December 2024.

The table below summarizes the maximum temperatures reported during monitoring from January 2023 through December 2023.

Monthly Temperature Effluent Data & Limits

| Month | Representative Highest Monthly Effluent Temperature | | Calculated Effluent Limit | |
|-------|---|---------------|------------------------------------|-----------------------------------|
| | Weekly Maximum | Daily Maximum | Weekly Average Effluent Limitation | Daily Maximum Effluent Limitation |
| | (°F) | (°F) | (°F) | (°F) |
| JAN | 61 | 62 | 103 | 120 |
| FEB | 60 | 60 | 101 | 120 |
| MAR | 58 | 61 | 87 | 120 |
| APR | 62 | 64 | 69 | 120 |
| MAY | 67 | 68 | 84 | 120 |
| JUN | 73 | 75 | 95 | 113 |
| JUL | 75 | 77 | 108 | 117 |
| AUG | 77 | 78 | 119 | 120 |
| SEP | 75 | 76 | 113 | 120 |
| OCT | 75 | 75 | 81 | 120 |
| NOV | 70 | 70 | 73 | 120 |
| DEC | 67 | 68 | 93 | 120 |

Reasonable Potential

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

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
 - (a) The highest recorded representative daily maximum effluent temperature
 - (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub-lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
 - (a) The highest weekly average effluent temperature for the month.
 - (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Based on the available effluent data, **temperature limits are not required. A full year of monitoring is recommended during the fourth year of the permit** to be used for the next permit reissuance. The complete thermal table used for this calculation is in Attachment #4.

PART 8 – WHOLE EFFLUENT TOXICITY (WET)

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

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC₂₅ (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The **IWC of 24%**, shown in the WET Checklist summary below, was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

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

Where:

- Q_e = annual average flow = 2.7 MGD = 4.2 cfs
- f = fraction of the Q_e withdrawn from the receiving water = 0
- Q_s = ¼ of the 7-Q₁₀ = 53 cfs ÷ 4 = 13.25 cfs

Attachment #1

- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known discharge. The specific receiving water location must be specified in the WPDES permit.
- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

Tests conducted prior to 2005 are not presented in the table below due to significant changes that were made to WET test methods in 2004, and these changes were assumed to be fully implemented by certified labs by no later than June 2005. Data collected before July 1, 2005 does not show repeated toxicity that was never resolved and is not the only data that is available.

WET Data History

| Date Test Initiated | Acute Results | | | | Chronic Results | | | | Footnotes or Comments |
|---------------------|--|----------------|---------------|-------------|--------------------|----------------|---------------|------------|-----------------------|
| | LC ₅₀ % (% survival in 100% effluent) | | | | IC ₂₅ % | | | | |
| | <i>C. dubia</i> | Fathead minnow | Pass or Fail? | Used in RP? | <i>C. dubia</i> | Fathead Minnow | Pass or Fail? | Use in RP? | |
| 05/08/2007 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 01/22/2008 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 07/21/2009 | >100 | >100 | Pass | No | >100 | >100 | Pass | No | 1 |
| 11/02/2010 | >100 | >100 | Pass | No | >100 | >100 | Pass | No | 1 |
| 10/28/2014 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 01/13/2015 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 04/19/2016 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 07/11/2017 | >100 | 73.7 | Fail | Yes | >100 | >100 | Pass | Yes | |
| 09/20/2017 | >100 | >100 | Pass | Yes | - | - | - | - | |
| 10/04/2017 | >100 | >100 | Pass | Yes | - | - | - | - | |
| 11/13/2018 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 10/15/2019 | >100 | >100 | Pass | Yes | 62.5 | >100 | Pass | Yes | |
| 01/21/2020 | >100 | >100 | Pass | Yes | >100 | >100 | Fail | No | 2 |
| 02/25/2020 | - | - | - | - | - | >100 | Pass | Yes | Retest |
| 04/13/2021 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 10/11/2022 | >100 | >100 | Pass | Yes | 8.4 | >100 | Fail | Yes | |
| 02/14/2023 | - | - | - | - | 36.1 | >100 | Pass | Yes | Retest |
| 02/28/2023 | - | - | - | - | >100 | 78.6 | Pass | Yes | Retest |
| 10/03/2023 | >100 | >100 | Pass | Yes | 61.5 | >100 | Pass | Yes | |

Attachment #1

| Date Test Initiated | Acute Results | | | | Chronic Results | | | | Footnotes or Comments |
|---------------------|--|----------------|---------------|-------------|--------------------|----------------|---------------|------------|-----------------------|
| | LC ₅₀ % (% survival in 100% effluent) | | | | IC ₂₅ % | | | | |
| | <i>C. dubia</i> | Fathead minnow | Pass or Fail? | Used in RP? | <i>C. dubia</i> | Fathead Minnow | Pass or Fail? | Use in RP? | |
| 04/09/2024 | >100 | >100 | Pass | Yes | >100 | >100 | Pass | Yes | |
| 01/14/2025 | >100 | >100 | Pass | Yes | 43.3 | >100 | Pass | Yes | |

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.
2. *Qualified or Inconclusive Data.* Fungus was found in the fathead minnow results. A retest was completed on 2/14/23.

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

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

Acute WET Limit Parameters

| TU _a (maximum) 100/LC ₅₀ | B (multiplication factor from s. NR 106.08(5)(c), Wis. Adm. Code, Table 4) |
|---|---|
| 100/73.7 = TU _a | 6.2 Based on 1 detect |

Acute Reasonable Potential = [(TU_a effluent) (B)] = 8.4 > 1.0

Chronic WET Limit Parameters

| TU _c (maximum) 100/IC ₂₅ | B (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4) | IWC |
|---|---|-----|
| 100/8.4 = 11.9 | 2.1 Based on 6 detects | 24% |

Chronic Reasonable Potential = [(TU_c effluent) (B)(IWC)] = 6.0 > 1.0

Therefore, **reasonable potential is shown for acute and chronic WET limits** using the procedures in s. NR 106.08(6), Wis. Adm. Code, and representative data from May 2007 through April 2024.

Expression of WET limits

Acute WET limit = 1.0 TU_a expressed as a daily maximum

Chronic WET limit = [100/IWC] TU_c = 100/24 = 4.2 TU_c expressed as a monthly average

Attachment #1

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

WET Checklist Summary

| | Acute | Chronic |
|---|--|--|
| AMZ/IWC | Not Applicable. 0 Points | IWC = 24% 0 Points |
| Historical Data | 15 tests used to calculate RP. One test failed. 0 Points | 16 tests used to calculate RP. One test failed. 0 Points |
| Effluent Variability | Little variability, few violations, no upsets, and consistent WWTF operations. 0 Points | Same as Acute. 0 Points |
| Receiving Water Classification | WWSF 5 Points | Same as Acute. 5 Points |
| Chemical-Specific Data | No reasonable potential for limits based on ATC. Ammonia nitrogen and residual chlorine limits carried over from the current permit. Chloride, chromium, copper, mercury, nickel, and zinc detected. Additional compounds of concern detected? Yes 5 Points | No reasonable potential for limits based on CTC. Ammonia nitrogen and residual chlorine limits carried over from the current permit. Chloride, chromium, copper, mercury, nickel, and zinc detected. Additional compounds of concern detected? Yes 5 Points |
| Additives | 1 biocide (sodium hypochlorite) and 2 water quality conditioners (sodium bisulfite and ferric chloride) added. Permittee has proper P chemical SOPs in place. 5 Points | All additives used more than once per 4 days. 5 Points |
| Discharge Category | 4 Industrial Contributors. 8 Points | Same as Acute. 8 Points |
| Wastewater Treatment | Secondary or better. 0 Points | Same as Acute. 0 Points |
| Downstream Impacts | No impacts known. 0 Points | Same as Acute. 0 Points |
| Total Checklist Points: | 23 Points | 23 Points |
| Recommended Monitoring Frequency (from Checklist): | 1x yearly. | 1x yearly. |
| Limit Required? | Limit = 1.0 TU _a | Limit = 4.2 TU _c |
| TRE Recommended? (from Checklist) | No | No |

Attachment #1

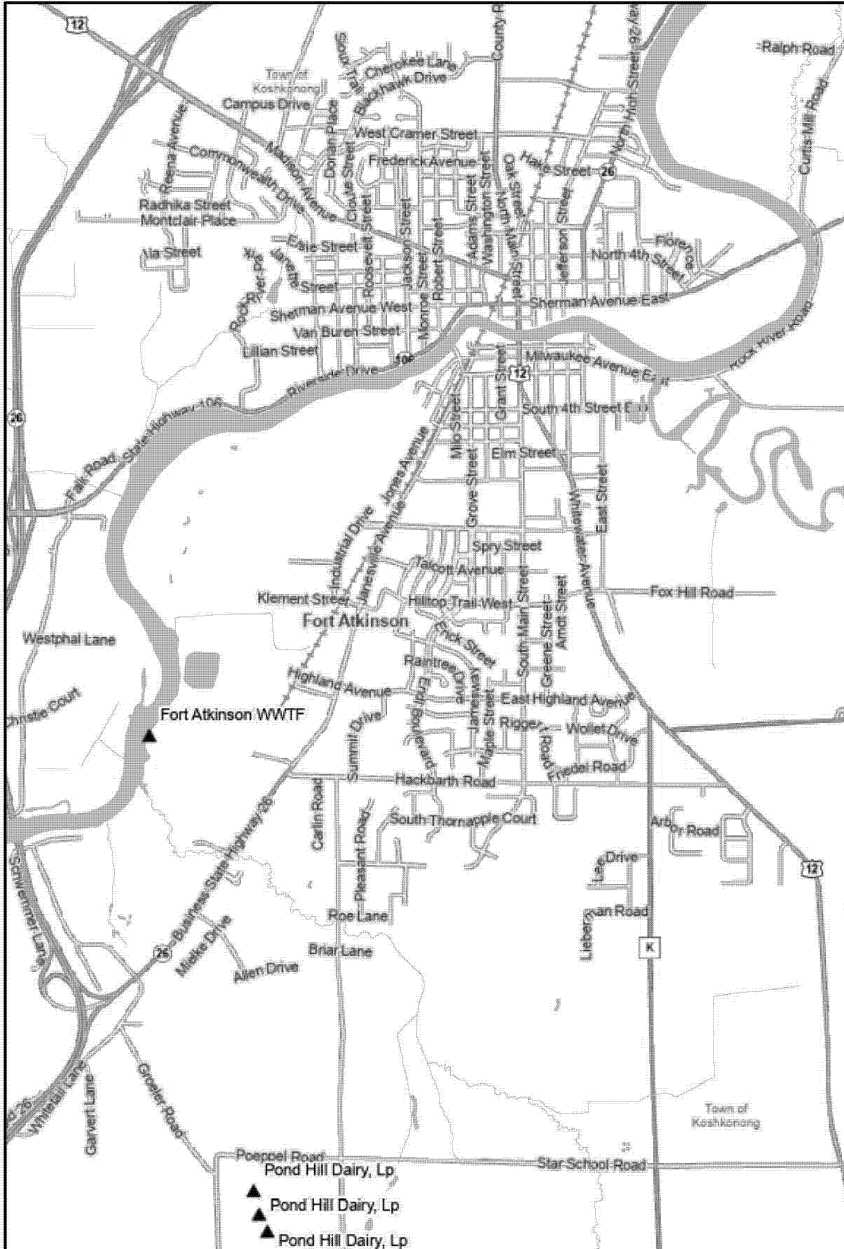
- After consideration of the guidance provided in the Department's *WET Program Guidance Document* (2022) and other information described on the previous pages, **annual acute and chronic WET tests are recommended in the reissued permit**. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).
- According to the requirements specified in s. NR 106.08, Wis. Adm. Code, acute and chronic WET limits are required. **The acute WET limit shall be expressed as 1.0 TU_a as a daily maximum in the effluent limits table of the permit. The chronic WET limit shall be expressed as 4.2 TU_c as a monthly average in the effluent limits table of the permit. A minimum of annual acute and chronic monitoring is required because acute and chronic WET limits are required.** Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
- **A minimum of annual acute and chronic monitoring is required because Fort Atkinson Wastewater Treatment Facility is a major municipal discharger** with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.

Attachment #2
Site Map



WISCONSIN
DEPARTMENT OF
NATURAL RESOURCES

Fort Atkinson Wastewater Treatment Facility



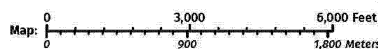
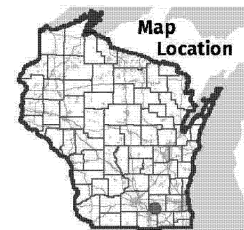
Legend: (some map layers may not be displayed)

- ▲ Surface Water Outfalls
- 24K Lakes and Open Water
- 24K Streams and Rivers
- City or Village
- County Boundaries
- Major Roads
 - State Highway
 - US Highway
 - County and Local Roads
 - County HWY
 - Local Road
- Railroads

Notes:

Discharge is to the Rock River. No longer to scale.

Service Layer Credits:
EN Basic Basemap WTM Ext, Permits & Determinations: WI DNR Bureau of Watershed Management



This map is a product generated by a DNR web mapping application.

This map is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. The user is solely responsible for verifying the accuracy of information before using for any purpose. By using this product for any purpose user agrees to be bound by all disclaimers found here: <https://dnr.wisconsin.gov/legal>

Date Printed: 1/20/2025 1:08 PM

Ammonia Nitrogen Effluent Limit Calculations from September 13, 2005 WQBEL Memo

The following table summarizes the effluent limitations for ammonia nitrogen. Effluent limitations were calculated in accordance with revised chs. NR 106.32 (Wis. Adm. Code).

| CLASSIFICATION: | WARMWATER SPORTFISH (Rock River) | | |
|-----------------------------------|---|---------------------|--------------|
| EFFLUENT FLOW (MGD): | 2.7 | | |
| EFFLUENT FLOW (cfs): | 4.178 | | |
| MAX. EFFLUENT pH (s.u.): | 8.10 | | |
| BACKGROUND INFORMATION: | <i>May – Sept.</i> | <i>Oct. - March</i> | <i>April</i> |
| 7-Q ₁₀ (cfs) | 53 | 53 | 53 |
| 7-Q ₂ (cfs) | 200 | 200 | 200 |
| Ammonia (mg/L) | 0.07 | 0.17 | 0.09 |
| Temperature (deg C) | 23 | 3 | 9 |
| pH (std. units) | 8.21 | 7.97 | 7.97 |
| % of river flow used: | 100 | 25 | 25 |
| Reference weekly flow: | 53 | 13.25 | 13.25 |
| Reference monthly flow: | 170 | 42.5 | 42.5 |
| CRITERIA (in mg/L): | | | |
| Acute (@ effl. pH): | 6.95 | 6.95 | 6.95 |
| 4-day Chronic (@ backgrd. pH): | | | |
| early life stages present | 2.55 | 6.35 | 6.35 |
| early life stages absent | 2.55 | 10.31 | 9.06 |
| 30-day Chronic (@ backgrd. pH) | | | |
| early life stages present | 1.02 | 2.54 | 2.54 |
| early life stages absent | 1.02 | 4.12 | 3.63 |
| EFFLUENT LIMITS (in mg/L): | | | |
| Daily maximum | 13.90 | 13.90 | 13.90 |
| Weekly average | | | |
| early life stages present | 34.06 | 25.95 | 26.21 |
| early life stages absent | | 42.48 | 37.53 |
| Monthly average | | | |
| early life stages present | 39.74 | 26.65 | 27.47 |
| early life stages absent | | 44.36 | 39.59 |

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 where burbot are not expected to be present.

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

| | | | | | | | |
|-------------------------------------|--------------------|---|---------------------------------------|-----|-------------------|-------------------|----------|
| Facility: | Fort Atkinson WWTF | 7-Q₁₀: | 53 | cfs | Temp Dates | Flow Dates | |
| Outfall(s): | 001 | Dilution: | 25% | | Start: | 01/02/23 | 07/01/19 |
| Date Prepared: | 1/15/2025 | f: | 0 | | End: | 12/29/23 | 12/21/24 |
| Design Flow (Q_e): | 2.7 MGD | Stream type: | Small warm water sport or forage fish | | | | |
| Storm Sewer Dist. | 0 ft | Q_s:Q_e ratio: | 3.2 | :1 | | | |
| | | Calculation Needed? | YES | | | | |

| Month | Water Quality Criteria | | | Receiving Water Flow Rate (Q _s) (cfs) | Representative Highest Effluent Flow Rate (Q _e) | | f | Representative Highest Monthly Effluent Temperature | | Calculated Effluent Limit | |
|-------|------------------------|----------------|-----------|---|---|--|---|---|---------------|------------------------------------|-----------------------------------|
| | Ta (default) | Sub-Lethal WQC | Acute WQC | | 7-day Rolling Average (Q _{esl}) (MGD) | Daily Maximum Flow Rate (Q _{ea}) (MGD) | | Weekly Average | Daily Maximum | Weekly Average Effluent Limitation | Daily Maximum Effluent Limitation |
| | (°F) | (°F) | (°F) | | (MGD) | (MGD) | | (°F) | (°F) | (°F) | (°F) |
| JAN | 33 | 49 | 76 | 53 | 2.522 | 2.664 | 0 | 61 | 62 | 103 | 120 |
| FEB | 34 | 50 | 76 | 53 | 2.712 | 4.038 | 0 | 60 | 60 | 101 | 120 |
| MAR | 38 | 52 | 77 | 53 | 3.474 | 3.690 | 0 | 58 | 61 | 87 | 120 |
| APR | 48 | 55 | 79 | 53 | 4.409 | 5.178 | 0 | 62 | 64 | 69 | 120 |
| MAY | 58 | 65 | 82 | 53 | 3.158 | 3.590 | 0 | 67 | 68 | 84 | 120 |
| JUN | 66 | 76 | 84 | 53 | 4.524 | 5.270 | 0 | 73 | 75 | 95 | 113 |
| JUL | 69 | 81 | 85 | 53 | 3.763 | 4.245 | 0 | 75 | 77 | 108 | 117 |
| AUG | 67 | 81 | 84 | 53 | 3.142 | 3.671 | 0 | 77 | 78 | 119 | 120 |
| SEP | 60 | 73 | 82 | 53 | 2.769 | 3.834 | 0 | 75 | 76 | 113 | 120 |
| OCT | 50 | 61 | 80 | 53 | 4.701 | 5.088 | 0 | 75 | 75 | 81 | 120 |
| NOV | 40 | 49 | 77 | 53 | 3.226 | 3.337 | 0 | 70 | 70 | 73 | 120 |
| DEC | 35 | 49 | 76 | 53 | 2.741 | 2.901 | 0 | 67 | 68 | 93 | 120 |

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
South Central Region Headquarters
3911 Fish Hatchery Rd
Fitchburg, WI 53711-5397

Tony Evers, Governor
Telephone (608) 275-3266
Toll Free 1-888-936-7463
TTY Access via relay - 711



December 18, 2024

Andy Selle
City Engineer
City of Fort Atkinson
101 N Main Street
Fort Atkinson WI, 53538

Subject: City of Fort Atkinson Municipal Separate Storm Sewer System (MS4) – WPDES Permit No. WI-S050075-3 – Water Quality Trading Plan – **CONDITIONAL APPROVAL**

Dear Mr. Selle:

On behalf of the Wisconsin Department of Natural Resources (WDNR), the WDNR has conditionally approved the proposed Water Quality Trading plan dated September 26, 2022. The Water Quality Trading (WQT) plan from the City of Fort Atkinson (Fort Atkinson) is designed to make progress on Total Phosphorus and Total Suspended Solids Rock River Total Maximum Daily Load (TMDL) Waste Load Allocations (WLAs) per MS4 permit requirements.

Based on WNDR review, the final WQT plan, dated September 2022, is in general conformance with WDNR Water Quality Trading guidance and Section 283.84 of the Wisconsin State Statutes.

The WQT plan indicates Fort Atkinson will utilize WQT to help achieve WLAs. Fort Atkinson's WQT plan proposes the MS4 conduct a trade with the municipal Wastewater Treatment Facility (WWTF) for excess treatment of Total Phosphorus and Total Suspended Solids per the WLAs with the WWTF discharging under a lowered permit limit in Rock River TMDL Reach 60. Table 1 below provides the amount of credit that will be available to Fort Atkinson's MS4.

Table 1

| Pollutant | Credits |
|------------------------|----------------|
| Total Phosphorus | 376 lbs/year |
| Total Suspended Solids | 15.6 tons/year |

WDNR conditionally approves the WQT plan as a basis for water quality trading during the next WPDES permit term. This approval is not to be construed as an approval for any activities requiring permit coverage under ch. 30 or 31, Wis. Stats. The Department has assigned the WQT plan a tracking number of **WQT-2024-0030** and will be referenced as such in the MS4 General Permit at the time of reissuance. The final WQT plan will be included as part of its own public notice and the final approval of the plan will be the issuance of the MS4 GP with Fort Atkinson's Plan referenced.

If you have any questions or comments, please contact me at 608-445-3078 or at sean.spencer@wisconsin.gov.

Thank you,

A handwritten signature in black ink that reads "Sean Spencer". The signature is written in a cursive style with a large, prominent 'S' at the beginning.

Sean Spencer
Stormwater Specialist
Wisconsin Department of Natural Resources

CITY OF FORT ATKINSON



Water Quality Trading Plan

September 26, 2022

Prepared By

WATER RESOURCE
ASSOCIATES

BACKGROUND

The City of Fort Atkinson is an operator of a municipal separate storm sewer system (MS4) currently regulated by the Wisconsin DNR under General Permit WI-S050075-3 which requires compliance with the standards specified in Administrative Code NR 216.07(6)(b) and NR 151.13. These codes require quantification of annual loads and reductions of Total Suspended Solids (TSS) and Total Phosphorus (TP) in storm water runoff from the City’s Municipal Separate Storm Sewer System (MS4).

The standards outlined within NR 151 require that regulated communities achieve a 20% reduction in TSS in runoff that enters waters of the state, relative to no controls. The City’s 2009 Citywide Storm Water Management Plan completed by MSA Professional Services identified that the City was achieving a 12.3% TSS reduction and recommended the implementation of several additional storm water quality treatment practices to improve its TSS reduction performance. The City has completed construction of the Larson Lagoon project which brought the estimated TSS reduction achieved by the City’s storm water system to approximately 29.6%. This brought the City into compliance with the 20% TSS reduction target.

In September 2011, USEPA approved a Total Maximum Daily Load (TMDL) for the Rock River Watershed which identified reductions of TSS and TP necessary to restore water quality to achieve designated uses for the Rock River and its tributaries. In addition to the requirement for Citywide reductions in TSS loads previously discussed, General Permit WI-S050075-3 requires additional reductions in TSS and TP according to the recommendations of USEPA approved TMDLs. The City of Fort Atkinson is located entirely within the Rock River Watershed and drains to three distinct reaches tributary to the Rock River: Rock River from Mile 213 to Bark River (R60), Bark River (R59) , and Rock River from Bark River to Crawfish River (R54).

In 2018, MSA Professional Services completed the City’s Storm Water Quality Plan Update - Rock River TMDL Assessment. Taken from that plan update, Table 1 below summarizes TSS and TP loads within the three reaches within the City.

Table 1 - Current TSS and TP Reduction Performance

| Study Area | Regulated Area | TSS Load | | | | TP Load | | | |
|-------------------------|----------------|-------------------|-------------------|-----------|------|------------------|------------------|-----------|------|
| | (acres) | Load In (tons/yr) | Trapped (tons/yr) | Reduction | Req. | Load In (lbs/yr) | Trapped (lbs/yr) | Reduction | Req. |
| Rock River (R60) | 2,058 | 324 | 119 | 36.7% | 41% | 1,999 | 596 | 29.8% | 48% |
| Bark River (R59) | 150 | 21 | 3 | 15.4% | 49% | 145 | 17 | 11.5% | 66% |
| Rock River (R54) | 469 | 86 | 6 | 6.5% | 44% | 479 | 26 | 5.4% | 72% |

The City’s storm water management system was found to not meet the TSS and TP reduction requirements identified in the TMDL for all three reaches of the Rock River Watershed, so the City will need to implement additional water quality practices to achieve the required pollutant load reductions.

The City is currently constructing a large improvement project at the Waste Water Treatment Facility

(WWTF) involving installation of ultrafiltration equipment. This project is necessary to achieve different permit requirements for operation of the WWTF and is designed to greatly exceed these requirements.

This Water Quality Trading Plan is intended to apply excess reduction in TSS and TP reduction from the WWTF to the portion of the City’s storm water quality management system within Reach 60. Because the WWTF is located within Reach 60, it is understood that the excess TSS and TP treatment can be applied at a 1.1:1 ratio to the storm water quality management system. This will allow the City to completely satisfy the pollutant load reduction requirements for all of Reach 60. The remaining excess treatment will then be reserved for future needs.

ANALYSIS OF CREDIT NEED

MSA Professional Services completed the City’s Storm Water Quality Plan Update - Rock River TMDL Assessment in 2018. Tables 2 and 3, below, are from the plan update and summarize the storm water quality treatment performance achieved by the City’s MS4. Per the MSA analysis, the City is not currently in compliance with TMDL storm water quality standards for any of the reaches for either TSS or TP reductions.

Table 2 - Additional Total Suspended Solids Reductions Necessary to Achieve TMDL Compliance

| Reach | TSS | | | |
|-------------------------|----------------------------|------------------|------------------|----------------------|
| | Regulated Load (tons/year) | Target Reduction | Actual Reduction | Shortage (tons/year) |
| Rock River (R54) | 86 | 44% | 6.5% | 32 |
| Bark River (R59) | 21 | 49% | 15.4% | 7 |
| Rock River (R60) | 324 | 41% | 36.7% | 14 |

Table 3 - Additional Total Phosphorus Reductions Necessary to Achieve TMDL Compliance

| Reach | TP | | | |
|-------------------------|---------------------------|------------------|------------------|---------------------|
| | Regulated Load (lbs/year) | Target Reduction | Actual Reduction | Shortage (lbs/year) |
| Rock River (R54) | 479 | 72% | 5.3% | 319 |
| Bark River (R59) | 145 | 66% | 11.5% | 79 |
| Rock River (R60) | 1,999 | 48% | 29.8% | 364 |

As indicated in these tables, within Reach 60, the City falls short of the required treatment levels by 14 tons/year for total suspended solids and 364 pounds/year for total phosphorus. The City intends to address these deficiencies by applying excess treatment from the WWTF through this Water Quality Trading Plan. Based on a trading ratio of 1.1: 1 the credits needed to meet the TMDL stormwater requirements are 15.4 tons per year for total suspended solids and 400.4 lbs per year of total

phosphorous.

ANALYSIS OF CREDIT AVAILABILITY

The City has recently completed a significant tertiary improvement project at the Waste Water Treatment Facility (WWTF) involving installation of tertiary filtration equipment. Commissioning of the new tertiary system at the WWTF included a one-month performance test of the completed system. The data from this first month of operation is included in the table below. Average mass of TSS and Tot-P for the 30 days were 63 lbs/d and 2.4 lbs/d respectively, which is well below pending TMDL permit levels. The TMDL permit levels are provided in Tables 5 and 6.

This WWTF project was designed by Donohue & Associates who also collected the data during the commissioning of the new tertiary system. A Donohue memo detailing all WWTF data and the proposed trading limits is attached.

Table 4 - Tertiary Treatment Data from 30 day Performance Test at Start-up

| Date | Plant Flow MGD | Secondary Effluent TSS mg/L | Final Effluent TSS mg/L | Final Effluent TSS lbs/d | Secondary Effluent Tot-P mg/L | Final Effluent Tot-P mg/L | Final Effluent Tot-P lbs/d |
|----------|----------------|-----------------------------|-------------------------|--------------------------|-------------------------------|---------------------------|----------------------------|
| 08/16/22 | 1.79 | 15 | 3.8 | 57 | 0.66 | 0.17 | 2.54 |
| 08/17/22 | 1.88 | 14.7 | 4.6 | 72 | 0.83 | 0.19 | 2.98 |
| 08/18/22 | 1.92 | 14.3 | 3.4 | 54 | 0.62 | 0.16 | 2.56 |
| 08/19/22 | 1.94 | 12 | 4.2 | 68 | 0.63 | 0.18 | 2.91 |
| 08/20/22 | 1.27 | 10.7 | 5.4 | 57 | 0.8 | 0.28 | 2.97 |
| 08/21/22 | 1.32 | 11 | 4 | 44 | 0.56 | 0.24 | 2.64 |
| 08/22/22 | 1.72 | 11.7 | 4 | 57 | 0.58 | 0.13 | 1.86 |
| 08/23/22 | 1.82 | 13.3 | 4.4 | 67 | 0.73 | 0.2 | 3.04 |
| 08/24/22 | 1.83 | 17.7 | 5.6 | 85 | 0.91 | 0.25 | 3.82 |
| 08/25/22 | 1.84 | 9.7 | 3.6 | 55 | 0.43 | 0.16 | 2.46 |
| 08/26/22 | 1.74 | 11.7 | 4.4 | 64 | 0.5 | 0.19 | 2.76 |
| 08/27/22 | 1.66 | 5 | 4 | 55 | 0.37 | 0.19 | 2.63 |
| 08/28/22 | 1.9 | 17 | 6.2 | 98 | 0.63 | 0.17 | 2.69 |
| 08/29/22 | 1.83 | 9.3 | 3.6 | 55 | 0.48 | 0.13 | 1.98 |

| | | | | | | | |
|----------------|-------------|-------------|------------|-----------|-------------|-------------|-------------|
| 08/30/22 | 1.75 | 9 | 3.8 | 55 | 0.4 | 0.12 | 1.75 |
| 08/31/22 | 1.8 | 12.7 | 5.4 | 81 | 0.44 | 0.13 | 1.95 |
| 09/01/22 | 1.7 | 8.3 | 4.2 | 60 | 0.42 | 0.17 | 2.41 |
| 09/02/22 | 1.52 | 3.3 | 4.2 | 53 | 0.26 | 0.15 | 1.90 |
| 09/03/22 | 1.25 | 3.7 | 4.6 | 48 | 0.3 | 0.15 | 1.56 |
| 09/04/22 | 0.89 | 6.7 | 3.8 | 28 | 0.6 | 0.27 | 2.00 |
| 09/05/22 | 1.07 | 8 | 3 | 27 | 0.6 | 0.2 | 1.78 |
| 09/06/22 | 1.57 | 9.7 | 2 | 26 | 0.55 | 0.12 | 1.57 |
| 09/07/22 | 1.6 | 9.7 | 4.4 | 59 | 0.61 | 0.14 | 1.87 |
| 09/08/22 | 1.59 | 11 | 3.2 | 42 | 0.49 | 0.13 | 1.72 |
| 09/09/22 | 1.48 | 8.7 | 4.6 | 57 | 0.46 | 0.13 | 1.60 |
| 09/10/22 | 1.54 | 9.7 | 4.6 | 59 | 0.68 | 0.16 | 2.05 |
| 09/11/22 | 2.34 | 15.7 | 5.2 | 101 | 0.62 | 0.17 | 3.32 |
| 09/12/22 | 3.83 | 12 | 3.6 | 115 | 0.49 | 0.11 | 3.51 |
| 09/13/22 | 2.5 | 9.3 | 3.4 | 71 | 0.4 | 0.11 | 2.29 |
| 09/14/22 | 2.79 | 10.7 | 5 | 116 | 0.42 | 0.11 | 2.56 |
| AVERAGE | 1.79 | 10.7 | 4.2 | 63 | 0.55 | 0.17 | 2.39 |

Table 5 - Monthly TSS Limits from WPDES Permit

| Month | Monthly Ave TSS Effluent Limit (lbs/day) | Weekly Ave TSS Effluent Limit (lbs/day) |
|-------|--|---|
| Jan | 659 | 870 |
| Feb | 732 | 966 |
| March | 659 | 870 |
| April | 683 | 902 |
| May | 659 | 870 |
| June | 683 | 902 |
| July | 659 | 870 |
| Aug | 659 | 870 |
| Sept | 683 | 902 |
| Oct | 659 | 870 |
| Nov | 683 | 902 |
| Dec | 659 | 870 |

Table 6 - Monthly TP Limits from WPDES Permit

| Month | Monthly Ave TP Effluent Limit (lbs/day) |
|-------|---|
| Jan | 13.7 |
| Feb | 19.5 |
| March | 20.7 |
| April | 23.5 |
| May | 22.4 |
| June | 20.8 |
| July | 16.2 |
| Aug | 12.8 |
| Sept | 11.2 |
| Oct | 10.4 |
| Nov | 10.6 |
| Dec | 11.5 |

The proposed Trade Agreement TSS and TP Limits are provided in tables 7 and 8. These are based on the WWTF operating data, the TMDL permit limits, and the goal to minimize chemical usage.

Table 7 - Trade Agreement TSS Limits for WWTF

| Month | Monthly Ave TSS Effluent Limit (lbs/day) | Weekly Ave TSS Effluent Limit (lbs/day) |
|---------|--|---|
| January | 587 | 870 |

| | | |
|-----------|-----|-----|
| February | 587 | 966 |
| March | 587 | 870 |
| April | 587 | 902 |
| May | 587 | 870 |
| June | 587 | 902 |
| July | 587 | 870 |
| August | 587 | 870 |
| September | 587 | 902 |
| October | 587 | 870 |
| November | 587 | 902 |
| December | 587 | 870 |

Table 8 - Trade Agreement TP Limits for WWTF

| Month | Monthly Ave TP Effluent Limit (lbs/day) |
|-----------|--|
| January | 13.7 |
| February | 18.7 |
| March | 18.7 |
| April | 18.7 |
| May | 18.7 |
| June | 18.7 |
| July | 16.2 |
| August | 12.8 |
| September | 11.2 |
| October | 10.4 |
| November | 10.6 |

| Month | Monthly Ave TP Effluent Limit (lbs/day) |
|-----------|--|
| January | 13.7 |
| February | 18.7 |
| March | 18.7 |
| April | 18.7 |
| May | 18.7 |
| June | 18.7 |
| July | 16.2 |
| August | 12.8 |
| September | 11.2 |
| December | 11.5 |

The proposed WWTP effluent limits for the Trade Agreement would result in annual credits as shown in Table 9. These credits exceed the city's TMDL storm water treatment requirements within Reach 60.

Table 9 - Trade Agreement WWTF Generated Credits

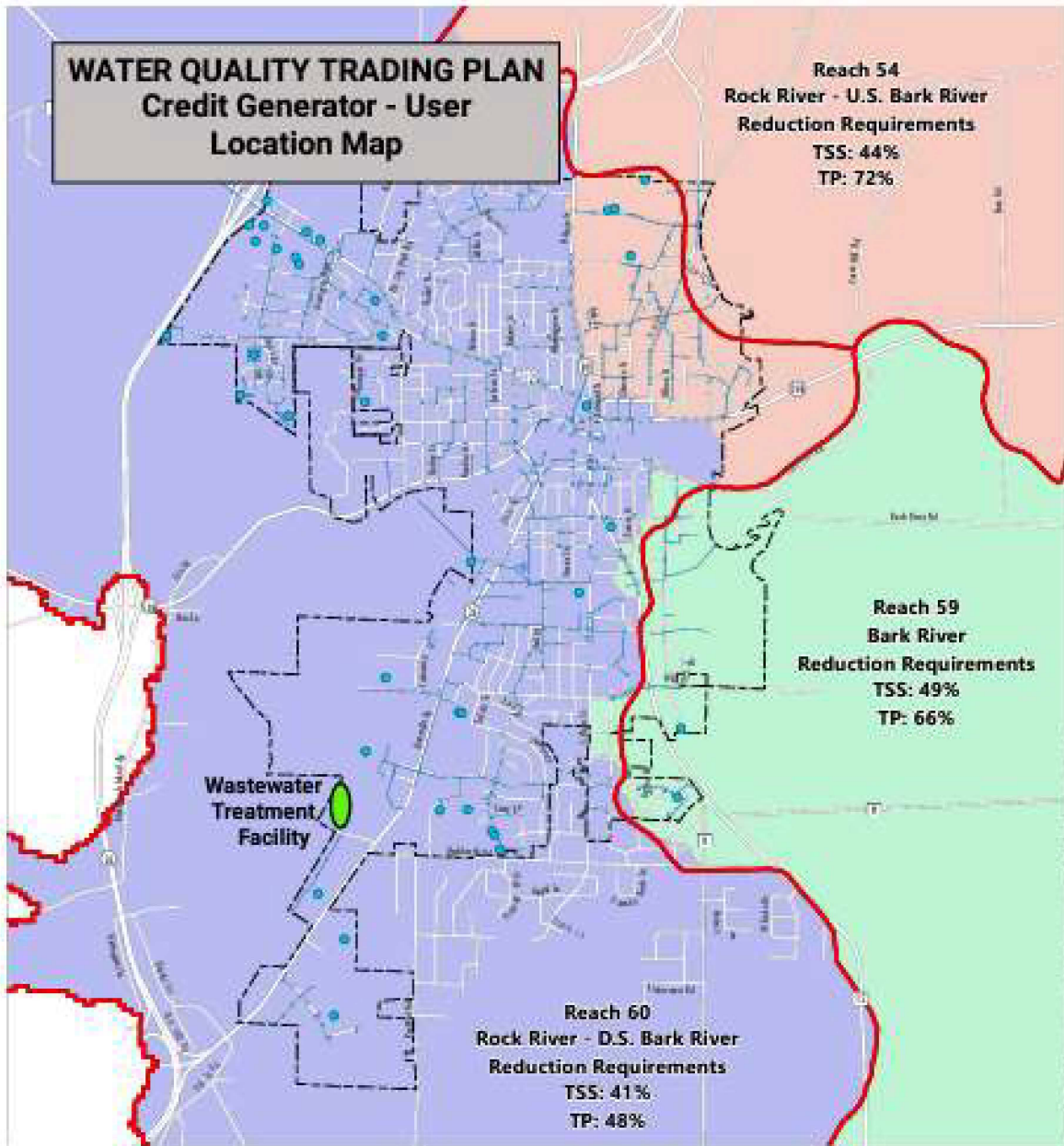
| | |
|-----------------------|----------------|
| TSS credits generated | 15.6 tons/year |
| TP credits generated | 406 lbs/year |

CONCLUSION

With completion of the current improvement project, the City of Fort Atkinson's Waste Water Treatment Facility provides high levels of Total Suspended Solids and Total Phosphorous treatment. This treatment allows the City to apply excess treatment to the City's MS4 storm water requirements under the Rock River TMDL through pollutant trading. The WWTF lies within Reach 60 as defined by the TMDL.

Through this Water Quality Trading Plan, the City will apply 14.1 tons/year of TSS and 376 lbs/years of TP from the WWTF to the MS4. These values are both below the credits generated a the WWTF. In doing so the City will meet the MS4 requirements for Reach 60 while continuing to meet the WWTF effluent limits.

**WATER QUALITY TRADING PLAN
Credit Generator - User
Location Map**



Memorandum

Date: September 22, 2022

To: Timothy Whittaker, Water Resource Associates

Copy: Andy Selle, Fort Atkinson
Paul Christensen, Fort Atkinson

From: Nathan Cassity P.E., Donohue & Associates



Re: Pollutant Trading Plan – WWTF to MS4

Donohue Recommended Trade Agreement Limits for the WWTF

The below provides information for the Pollutant Trading Plan from the perspective of the wastewater treatment facility (WWTF) WPDES permit limits.

1. TSS and Tot-P permitted WWTF effluent limits for the Rock River TMDL:

Monthly TSS Limits from WPDES Permit Monthly Tot-P Limits from WPDES Permit

| Month | Monthly Ave TSS Effluent Limit (lbs/day) | Weekly Ave TSS Effluent Limit (lbs/day) | Month | Monthly Ave TP Effluent Limit (lbs/day) |
|-------|--|---|-------|---|
| Jan | 659 | 870 | Jan | 13.7 |
| Feb | 732 | 966 | Feb | 19.5 |
| March | 659 | 870 | March | 20.7 |
| April | 683 | 902 | April | 23.5 |
| May | 659 | 870 | May | 22.4 |
| June | 683 | 902 | June | 20.8 |
| July | 659 | 870 | July | 16.2 |
| Aug | 659 | 870 | Aug | 12.8 |
| Sept | 683 | 902 | Sept | 11.2 |
| Oct | 659 | 870 | Oct | 10.4 |
| Nov | 683 | 902 | Nov | 10.6 |
| Dec | 659 | 870 | Dec | 11.5 |

2.

Donohue recommended reduced effluent limits for TSS & Tot-P:

Commissioning of the new tertiary system at the WWTF included a one month performance test of the completed system. The data from this first month of operation is included in the table below. Average mass of TSS and Tot-P for the 30 days were 63 lbs/d and 2.4 lbs/d respectively, well below pending TMDL permit levels. Please note this performance is with relatively high ferric chloride dosing and no focus on minimizing chemical usage. This performance demonstrates the ability of the new tertiary system to meet reduced effluent limits for the trade agreement.

Pollutant Trading Plan Memo

Nathan Cassity, Donohue & Associates

Tertiary Treatment Data from 30 day Performance Test at Start-up

| Date | Plant Flow MGD | Secondary Effluent TSS mg/L | Final Effluent TSS mg/L | Final Effluent TSS lbs/d | Secondary Effluent Tot-P mg/L | Final Effluent Tot-P mg/L | Final Effluent Tot-P lbs/d |
|-------------|-----------------------|------------------------------------|--------------------------------|---------------------------------|--------------------------------------|----------------------------------|-----------------------------------|
| 08/16/22 | 1.79 | 15 | 3.8 | 57 | 0.66 | 0.17 | 2.54 |
| 08/17/22 | 1.88 | 14.7 | 4.6 | 72 | 0.83 | 0.19 | 2.98 |
| 08/18/22 | 1.92 | 14.3 | 3.4 | 54 | 0.62 | 0.16 | 2.56 |
| 08/19/22 | 1.94 | 12 | 4.2 | 68 | 0.63 | 0.18 | 2.91 |
| 08/20/22 | 1.27 | 10.7 | 5.4 | 57 | 0.8 | 0.28 | 2.97 |
| 08/21/22 | 1.32 | 11 | 4 | 44 | 0.56 | 0.24 | 2.64 |
| 08/22/22 | 1.72 | 11.7 | 4 | 57 | 0.58 | 0.13 | 1.86 |
| 08/23/22 | 1.82 | 13.3 | 4.4 | 67 | 0.73 | 0.2 | 3.04 |
| 08/24/22 | 1.83 | 17.7 | 5.6 | 85 | 0.91 | 0.25 | 3.82 |
| 08/25/22 | 1.84 | 9.7 | 3.6 | 55 | 0.43 | 0.16 | 2.46 |
| 08/26/22 | 1.74 | 11.7 | 4.4 | 64 | 0.5 | 0.19 | 2.76 |
| 08/27/22 | 1.66 | 5 | 4 | 55 | 0.37 | 0.19 | 2.63 |
| 08/28/22 | 1.9 | 17 | 6.2 | 98 | 0.63 | 0.17 | 2.69 |
| 08/29/22 | 1.83 | 9.3 | 3.6 | 55 | 0.48 | 0.13 | 1.98 |
| 08/30/22 | 1.75 | 9 | 3.8 | 55 | 0.4 | 0.12 | 1.75 |
| 08/31/22 | 1.8 | 12.7 | 5.4 | 81 | 0.44 | 0.13 | 1.95 |
| 09/01/22 | 1.7 | 8.3 | 4.2 | 60 | 0.42 | 0.17 | 2.41 |
| 09/02/22 | 1.52 | 3.3 | 4.2 | 53 | 0.26 | 0.15 | 1.90 |
| 09/03/22 | 1.25 | 3.7 | 4.6 | 48 | 0.3 | 0.15 | 1.56 |
| 09/04/22 | 0.89 | 6.7 | 3.8 | 28 | 0.6 | 0.27 | 2.00 |
| 09/05/22 | 1.07 | 8 | 3 | 27 | 0.6 | 0.2 | 1.78 |
| 09/06/22 | 1.57 | 9.7 | 2 | 26 | 0.55 | 0.12 | 1.57 |
| 09/07/22 | 1.6 | 9.7 | 4.4 | 59 | 0.61 | 0.14 | 1.87 |

| | | | | | | | |
|----------------|-------------|-------------|------------|-----------|-------------|-------------|-------------|
| 09/08/22 | 1.59 | 11 | 3.2 | 42 | 0.49 | 0.13 | 1.72 |
| 09/09/22 | 1.48 | 8.7 | 4.6 | 57 | 0.46 | 0.13 | 1.60 |
| 09/10/22 | 1.54 | 9.7 | 4.6 | 59 | 0.68 | 0.16 | 2.05 |
| 09/11/22 | 2.34 | 15.7 | 5.2 | 101 | 0.62 | 0.17 | 3.32 |
| 09/12/22 | 3.83 | 12 | 3.6 | 115 | 0.49 | 0.11 | 3.51 |
| 09/13/22 | 2.5 | 9.3 | 3.4 | 71 | 0.4 | 0.11 | 2.29 |
| 09/14/22 | 2.79 | 10.7 | 5 | 116 | 0.42 | 0.11 | 2.56 |
| AVERAGE | 1.79 | 10.7 | 4.2 | 63 | 0.55 | 0.17 | 2.39 |

Pollutant Trading Plan Memo Nathan
Cassidy, Donohue & Associates

The below limit values are recommended by Donohue based on minimizing chemical usage to meet performance utilizing the new tertiary treatment system at the WWTF. They are conservative since the new tertiary system has recently started up and long term performance data is not available. Since the new tertiary treatment is sized for future flows and loads to 2035, the City will be able to meet these recommended permit limits through the next 10 years.

Recommended Trade Agreement TSS Limits for the WWTF

| Month | Monthly Ave TSS Effluent Limit (lbs/day) | Weekly Ave TSS Effluent Limit (lbs/day) |
|-----------|---|--|
| January | 587 | 870 |
| February | 587 | 966 |
| March | 587 | 870 |
| April | 587 | 902 |
| May | 587 | 870 |
| June | 587 | 902 |
| July | 587 | 870 |
| August | 587 | 870 |
| September | 587 | 902 |

| | | |
|----------|-----|-----|
| October | 587 | 870 |
| November | 587 | 902 |
| December | 587 | 870 |

Recommended Trade Agreement Tot-P Limits for the WWTF

| Month | Monthly Ave TP Effluent Limit (lbs/day) |
|-----------|--|
| January | 13.7 |
| February | 18.7 |
| March | 18.7 |
| April | 18.7 |
| May | 18.7 |
| June | 18.7 |
| July | 16.2 |
| August | 12.8 |
| September | 11.2 |
| October | 10.4 |
| November | 10.6 |
| December | 11.5 |

You'll notice the Tot-P limits do not change for the months of January, July, August, September, October, November, and December since the permit limits are below Donohue's recommendation. During these months chemical usage will be increased in the new tertiary treatment system to achieve compliance.

3. The proposed WWTP effluent limits for the Trade Agreement would result in the following annual credits being generated.

| | |
|----------------------------------|----------------|
| TSS credits generated per year | 15.6 tons/year |
| Tot-P credits generated per year | 406 lbs-P/year |