

Permit Fact Sheet

General Information

Permit Number:	WI-0029971-09-0	
Permittee Name:	City of Waukesha	
Address:	600 Sentry Dr	
City/State/Zip:	Waukesha, WI 53186	
Discharge Location:	<p>Outfall 001 – East bank of the Fox (IL) River, one half mile downstream of the Prairie Street Bridge in Waukesha, WI (NW ¼, NE ¼, S09, T6N, R19E)</p> <p>Outfall 006 – Root River downstream of 60th Street and Oakwood in Franklin, WI (NW ¼, NW ¼, S35, T5N, R21E).</p>	
Receiving Water:	<p>Outfall 001 - Fox (IL) River (Upper Fox (IL) River Watershed, Fox (IL) River Basin) in Waukesha County</p> <p>Outfall 006 - Root River (Root River Watershed, Root-Pike River Basin) in Milwaukee County</p>	
Stream Flow (Q _{7,10}):	<p>Fox River – 8.0 cfs</p> <p>Root River – 2.4 cfs</p>	
Stream Classification:	<p>Fox River – warm water sport fish community, non-public water supply</p> <p>Root River – warm water sport fish community, non-public water supply</p>	
Design Flow(s)	Daily Maximum	33.5 MGD
	Weekly Maximum	19.3 MGD
	Monthly Maximum	18.5 MGD
	Annual Average	14 MGD
Significant Industrial Loading?	Yes. As a control authority, Waukesha currently regulates 6 significant industrial users under the City’s pretreatment program. There is a total of 18 categorical industrial users. Waukesha WWTP also accepts domestic and industrial hauled wastes which include landfill leachate, contaminated groundwater, septic tank and holding tank wastes.	
Operator at Proper Grade?	Yes, the OIC holds Advanced – A1, A2, B, C, D, L, & P and the plant requires Advanced – A1, B, C, D, L, P & SS SS Subclass required by end of permit term.	
Approved Pretreatment Program?	Yes. June 27, 1985	

Facility Description

The City of Waukesha (“City”) Clean Water Plant (CWP) operates a 14 MGD extended aeration activated sludge wastewater treatment facility (WWTF). The WWTF provides service to an estimated population of 73,000 people, as well as 18 categorical and 6 significant industrial users. The backup power supply, digestion, solids dewatering, reaeration, and disinfection treatment processes have recently been upgraded at the WWTF, and a phosphorus treatment capacity upgrade will occur in the next three years. Wastewater treatment processes currently include screening and grit

removal, influent pumping, primary clarification, primary effluent pumping, activated sludge, chemical phosphorus removal with coagulation, secondary clarification and tertiary filtration, ultraviolet light disinfection, and post aeration before discharge to the Fox (IL) River (Outfall 001). Biosolids treatment processes include waste activated sludge (WAS) thickening by dissolved air flotation, anaerobic digestion of primary solids and WAS, liquid sludge storage, centrifuge dewatering, and dewatered biosolids cake storage. Biosolids are land-applied to Department of Natural Resources (DNR) - approved agricultural sites.

As a condition of the 2016 S. Lawrence-Great Lakes River Water Resources Compact approval, Waukesha must return to the Root River, a daily quantity of treated wastewater equivalent to or in excess of the previous calendar year’s average daily diversion. On any days when the total quantity of treated wastewater is insufficient to meet this target, all treated wastewater must be returned to the Root River. The selected return flow discharge location is the Root River near Franklin, WI. Based on the current schedule, water supply changeover will begin in late 2022 and will be completed in 2023. Due to the transition of the water supply from groundwater to Lake Michigan being complete within the next five years, the City has requested that the reissued WPDES permit include requirements for the required return flow discharge to the Great Lakes Basin. The return flow discharge is referred to as Outfall 006. The City is limited to withdrawing no more than 8.2 MGD from Lake Michigan under the terms of the 2016 Great Lakes – St. Lawrence River Basin Water Resources Council approval (Approval), but the amount of the return flow includes water from infiltration and other sources typical of wastewater collection systems. In order to meet the return flow requirements of the Approval and allow an equivalent return volume of water to Lake Michigan, there are times when the permittee will need to return more water than what was withdrawn due to typical diurnal fluctuations of wastewater flows. A return flow rate of 9.3 MGD was calculated as the amount needed to meet the Approval requirements for the future Lake Michigan water demand of 8.2 MGD.

The Department has found the facility to be in substantial compliance with the current permit.

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/sample Contents and Treatment Description (as applicable)
702	9.58 MGD (2014-2018 Average)	INFLUENT: 24-hr flow proportional composite samples shall be collected after screening and grit removal and prior to the addition of recycled flows (i.e. filter backwash, sludge centrate water, sludge thickener supernatant and clarifier drains).
001	9.62 MGD (2014-2018 Average)	EFFLUENT: 24-Hr flow proportional composite samples shall be collected from the effluent chamber after the UV disinfection system but before the Parshall flume. Grab samples shall be collected from the effluent drop box, after Parshall flume.
002	1,352 dry U.S. tons (2017 permit application)	Class B, anaerobically digested, centrifuge thickened, cake sludge. Representative samples shall be collected and composited from the centrifuge and sludge storage bays prior to land application.
005	200 dry U.S. tons (2017 permit application)	Class B, anaerobically digested, liquid sludge. Representative samples shall be collected from the sludge storage tank recirculation pump prior to land application, hauling to another facility, or landfilling. Hauled or landfilled sludge reports shall be submitted on Form 3400-52 "Other Methods of Disposal or Distribution Report" following each year sludge is hauled or landfilled.
006	New Outfall	EFFLUENT: Sampling shall be the same as Outfall 001 except

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, Waste Type/sample Contents and Treatment Description (as applicable)
		monitoring for dissolved oxygen, temperature, and additional pH shall be conducted at the outfall to the Root River after aeration. Flow is monitored at the treatment plant. **This outfall is currently inactive and the permittee should notify the Department 90-days prior to the commencement of discharge.**
101	N/A	FIELD BLANK: Collect mercury field blank using standard sample handling procedures.
104	New Sample Point	In-Plant Diversion OTHER BYPASS: Sample point for reporting diverted flow which bypasses the existing treatment process or the proposed tertiary treatment process of coagulation, flocculation & sedimentation, and granular media filtration prior to ultraviolet disinfection.
105	New Sample Point	LAKE MICHIGAN WATER SUPPLY: A grab sample of raw Lake Michigan water shall be collected from the water supply facility, prior to receiving any treatment. **This sample point is inactive and the permittee should notify the Department at least 90-days prior to the anticipated commencement of discharge at Outfall 006 in order to activate.**

1 Influent - Proposed Monitoring

1.1 Sample Point Number: 702- 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	Daily	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Daily	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Monthly	24-Hr Flow Prop Comp	See Mercury section 1.2.1.2 of the permit.
Cadmium, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	
Chromium, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Lead, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	

1.1.1 Changes from Previous Permit:

No changes from previous permit.

1.1.2 Explanation of Limits and Monitoring Requirements

BOD₅ and Total Suspended Solids: Tracking of BOD₅, and Suspended Solids are required for percent removal requirements found in s. NR 210.05, Wis. Adm. Code and in the Standard Requirements section of the permit.

Cadmium, Chromium, Copper, Lead, Nickel, and Zinc: Since Waukesha is a control authority subject to state and federal pretreatment requirements, the proposed permit will continue to include monitoring of influent for Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc as part of the pretreatment program.

Mercury, Total Recoverable: Mercury monitoring is included in the proposed permit pursuant to s. NR 106.145, Wis. Adm. Code. Required field blanks for Mercury monitoring per ss. NR 106.145(9) and (10), Wis. Adm. Code, requirements. The permittee shall collect a mercury field blank for each set of mercury samples (a set of samples may include a combination of water supply, influent, effluent or other samples all collected on the same day). In accordance with s. NR 106.145(9)(a), Wis. Adm. Code, the sample type may be grab or 24-hr composite. Influent mercury concentrations reported from 2014-2018 at the Clean Water Plant averaged 200 ng/L, therefore a high level of sensitivity is not required and the 24-hr composite sample is sufficient.

2 Inplant - Proposed Monitoring and Limitations

2.1 Sample Point Number: 101- FIELD BLANK

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Mercury, Total Recoverable		ng/L	Monthly	Blank	See Mercury permit section 2.2.1.1.

2.1.1 Changes from Previous Permit:

Sample type updated from "Grab" to "Blank".

2.1.2 Explanation of Limits and Monitoring Requirements

Required field blanks for Mercury monitoring per ss. NR 106.145(9) and (10), Wis. Adm. Code, requirements. The permittee shall collect a mercury field blank for each set of mercury samples (as set of samples may include a combination of water supply, influent, effluent or other samples all collected on the same day). The permittee shall report results of influent and effluent samples and field blanks to the Department on Discharge Monitoring Reports.

2.2 Sample Point Number: 104- In-Plant Diversion-Other Bypass

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	Start flow measurement at the commencement of bypass operations. Measure flow in daily increments until operation ends and report daily bypass flow on the eDMR. See permit section 2.2.2.1.
Time		hours	Daily	Calculated	Report the total duration of 'Other Bypass' within any given day (12:00am - 11:59pm) in which the 'Other Bypass' occurs. See permit section 2.2.2.1.

2.2.1 Changes from Previous Permit:

Sample point 102 was removed from the permit as the in-plant diversion associated with that sample point is no longer operational. Sample point 104 and the corresponding permit requirements were added as a result of updates made to ch. NR 205, Wis. Adm. Code.

2.2.2 Explanation of Limits and Monitoring Requirements

The department has determined that a partial bypass of the current tertiary treatment process and proposed treatment process of coagulation, flocculation & sedimentation, and granular media filtration may occur at this facility and are considered an 'other bypass' as defined in s. NR 205.07(1)(u)3., Wis. Adm. Code. Sample point 104 was included for measuring diverted flow during wet weather or other high flow conditions whenever the 'other bypass' operations are in effect, typically when flows are in excess of 32 MGD. A bypass that is defined as a controlled diversion in s. NR 205.07(1)(v), Wis. Adm. Code, is not included under this sample point. See permit section 2.2.2.1 for additional requirements.

2.3 Sample Point Number: 105- Water Supply

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MG	Monthly	Calculated	Report the sum of the total

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
					monthly intake flows.
Mercury, Total Recoverable		ng/L	Monthly	Grab	See Mercury permit section 2.2.3.1.
Mercury, Total Recoverable		grams/month	Monthly	Calculated	See permit section 2.2.3.2 for calculation.
Mercury, Total Recoverable		grams/yr	Annual	Calculated	Report the sum of the total monthly intake mass loading for the calendar year on the Annual report form.

2.3.1 Changes from Previous Permit:

Sample point 105 and the corresponding sampling and reporting requirements were added.

2.3.2 Explanation of Monitoring Requirements

The monitoring requirements for sample point 105 are included to collected data and allow for calculation of the total recoverable mercury mass balance between what is being withdrawn for the water supply and returned to Lake Michigan.

The conversion factor in the equation in permit section 2.2.3.2, used to derive the mass of mercury in grams/month was determined using the following equation;

$$\frac{1 \text{ mg/L}}{1000000 \text{ ng/L}} \times 8.34 \times \frac{453.6 \text{ grams}}{1 \text{ lb}} = 0.00378$$

3 Surface Water - Proposed Monitoring and Limitations

3.1 Sample Point Number: 001- EFFLUENT - Fox River

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	After commencement of the return flow discharge the flow rate sample type for Outfall 001 will be considered as Calculated based on the proposed plans and specifications.
BOD5, Total	Weekly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective November - April
BOD5, Total	Weekly Avg	7.9 mg/L	Daily	24-Hr Flow	Limit effective May -

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
				Prop Comp	October
BOD5, Total	Monthly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective November - April
BOD5, Total	Monthly Avg	7.9 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective May - October
Suspended Solids, Total	Weekly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Year round
Suspended Solids, Total	Monthly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Year round
pH Field	Daily Max	9.0 su	Daily	Grab	Year round
pH Field	Daily Min	6.0 su	Daily	Grab	Year round
Fecal Coliform	Geometric Mean - Wkly	848 #/100 ml	3/Week	Grab	Limit and monitoring effective May - September
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	3/Week	Grab	Limit and monitoring effective May - September
Dissolved Oxygen	Daily Min	7.0 mg/L	Daily	Grab	Year round
Nitrogen, Ammonia (NH3-N) Total	Daily Max	17 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective January and December
Nitrogen, Ammonia (NH3-N) Total	Daily Max	18 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective February
Nitrogen, Ammonia (NH3-N) Total	Daily Max	22 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective March
Nitrogen, Ammonia (NH3-N) Total	Daily Max	24 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective April
Nitrogen, Ammonia (NH3-N) Total	Daily Max	19 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective November
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	11 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective January and December
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	12 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective February and November
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	13 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective March
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective April
Nitrogen, Ammonia	Weekly Avg	8.5 mg/L	Daily	24-Hr Flow	Limit effective May

Monitoring Requirements and Limitations

Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
(NH3-N) Total				Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	5.6 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective June
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	3.9 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective July
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	4.2 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective August
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	5.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective September
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	9.2 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective October
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective January
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.2 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective February
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	6.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective March
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.6 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.9 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective May and December
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.1 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective June
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective July
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.1 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective August
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.9 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective September
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective October
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.1 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective November
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring only
Nitrogen, Nitrite +		mg/L	Quarterly	24-Hr Flow	Monitoring only

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Nitrate Total				Prop Comp	
Nitrogen, Total		mg/L	Quarterly	Calculated	Monitoring only
Phosphorus, Total	Monthly Avg	0.6 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit. Final limits become effective June 30, 2022. See Phosphorus schedule in permit section 5.1.
Phosphorus, Total	Monthly Avg	0.225 mg/L	Daily	24-Hr Flow Prop Comp	Final limit becomes effective on June 30, 2022.
Phosphorus, Total	6-Month Avg	0.075 mg/L	Daily	24-Hr Flow Prop Comp	Final limit becomes effective on June 30, 2022. See permit section 6.4.2 for six-month average calculation and reporting.
Phosphorus, Total	6-Month Avg	8.76 lbs/day	Daily	Calculated	Final limit becomes effective on June 30, 2022. See permit section 6.4.2 for six-month average calculation and reporting.
Chloride	Weekly Avg	570 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit effective May - November. Sampling shall be done on four consecutive days one week per month. See Chloride Variance permit section and Schedules permit section 5.2 for applicable target value.
Chloride	Weekly Avg	620 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit effective December - April. Sampling shall be done on four consecutive days one week per month. See Chloride Variance permit section and Schedules permit section 5.2 for applicable target value.
Chloride		lbs/day	4/Month	Calculated	Chloride mass = daily concentration (mg/L) x daily flow (MGD) x 8.34.
Cadmium, Total		ug/L	Quarterly	24-Hr Flow	See permit section 3.2.1.2.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Recoverable				Prop Comp	
Chromium, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	See permit section 3.2.1.2.
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	See permit section 3.2.1.2.
Lead, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	See permit section 3.2.1.2.
Mercury, Total Recoverable		ng/L	Monthly	Grab	See permit section 3.2.1.3.
Nickel, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	See permit section 3.2.1.2.
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	See permit section 3.2.1.2.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See WET permit section.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See WET permit section.
Temperature Maximum		deg F	3/Week	Continuous	Monitoring in calendar year 2023. (January 1 - December 31).

3.1.1 Changes from Previous Permit

BOD₅ – the existing weekly average limits were updated, and monthly average limits were added.

Total Suspended Solids – a 10 mg/L weekly average limit was added.

Fecal Coliform - A weekly geometric mean of 848 #/100mL was added to the proposed permit as part of changes to the procedures in ch. NR 106, Wis. Adm. Code.

Dissolved Oxygen – the 7.0 mg/L daily minimum limit is now effective year-round.

Ammonia – the existing daily maximum, weekly average, and monthly average limits were updated and limits are included for each month of the year.

Total Nitrogen Monitoring (NO₂+NO₃, TKN and Total N): Quarterly monitoring added to the proposed permit.

Total Phosphorus – the monthly average interim limit of 0.7 mg/L is reduced to 0.6 mg/L and final water quality based effluent limits become effective on June 30, 2022.

Chloride – the interim limit was updated from a year-round weekly average limit of 690 mg/L to seasonal weekly average limits of 570 mg/L (May – November) and 620 mg/L (December – April).

3.1.2 Explanation of Limits and Monitoring Requirements

Categorical Limits

- **BOD₅, Total Suspended Solids, pH, Dissolved Oxygen, and Fecal Coliforms:** Standard municipal wastewater requirements for BOD₅, total suspended solids, dissolved oxygen, pH, and fecal coliforms are included based on ch. NR 210, Wis. Adm. Code ‘Sewage Treatment Works’ requirements for discharges to fish and aquatic life receiving waters. Chapter NR 102, Wis. Adm. Code ‘Water Quality Standards for Surface Waters’ also specifies requirements for pH for fish and aquatic life.

Regulatory changes to s. NR 205.065, Wis. Adm. Code, became effective September 1, 2016 and require limits in this permit to be expressed as weekly average and monthly average limits whenever practicable. These changes are based on 40 CFR 122.45(d). Minor changes have been made to BOD₅, TSS, and fecal coliform limitations from the previous permit in order to comply with this regulation.

Water Quality Based Limits and WET Requirements

Refer to the Water Quality-Based Effluent Limitations (WQBELs) memo for the City of Waukesha prepared by Nick Lent dated June 20, 2019, revised August 13, 2019 and used for this reissuance.

- **Ammonia Total Nitrogen:** Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Table 2C and Table 4B of ch. NR 105, Wis. Adm. Code (effective March 1, 2004). Subchapter IV of ch. NR 106 establishes procedures for calculating water quality-based effluent limitations (WQBELs) for ammonia (effective March 1, 2004). The daily maximum limits are included from November - April, and weekly average, and monthly average ammonia limits are included for all months.
- **Total Nitrogen Monitoring (NO₂+NO₃, TKN and Total N):** Based on the “Guidance for Total Nitrogen Monitoring in WPDES Permits” dated October 2012, quarterly effluent monitoring for Total Nitrogen is required for municipal majors discharging to the Mississippi River Basin.
- **Total Phosphorus:** The proposed permit will be Waukesha’s second permit term under new administrative rules for phosphorus discharges that took effect December 1, 2010. Details regarding the administrative rules for phosphorus discharges may be found at: <http://dnr.wi.gov/topic/surfacewater/phosphorus.html>. The phosphorus rules are contained in s. NR 102.06 and ch. NR 217, Subchapter III. Waukesha’s final water quality based effluent limits (WQBELs) for phosphorus are 0.075 mg/L and 8.76 lbs/day as a six-month average and 0.225 mg/L as a monthly average and are effective on July 1, 2022. A 0.6 mg/L monthly average interim limit is included and is effective through June 30, 2022.
- **Chloride:** The calculated 4-day P99 is above the applicable chronic limitation of 410 mg/L, so a chronic (weekly average) limit needs to be continued for the reissued permit. However, the permittee has re-applied for a variance from the chronic chloride water quality criterion, which requires EPA approval. Interim limits of 620 mg/L (December- April) and 570 mg/L (May-November) are included. As a condition of this variance target values of 560 mg/L (December-April) and 530 mg/L (May-November) and the implementation of chloride source reduction measures, intended to lead to compliance with the target value by the end of the permit term, are also included in the proposed permit. See the schedules section for the chloride schedule. Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code; Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride.
- **Cadmium, Chromium, Copper, Lead, Nickel and Zinc:** Since Waukesha is a control authority subject to state and federal pretreatment requirements, the proposed permit will continue to include quarterly monitoring of effluent for cadmium, chromium, lead, and nickel and monthly monitoring for copper and zinc.
- **Mercury:** Representative data shows there is no reasonable potential for the effluent to exceed the water quality-based 1.3 ng/L monthly average limit, therefore no mercury limit is recommended in the proposed permit.

Monthly mercury monitoring is retained. Requirements for mercury are included in s. NR 106.145, Wis. Adm. Code (effective November 2002).

- Acute and Chronic WET:** Whole Effluent Toxicity (WET) testing requirements are determined in accordance with ss. NR 106.08 and NR 106.09, Wis. Adm. Code. See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist. The WET Guidance Document was used to determine appropriate test frequencies. (A completed checklist for outfall 001 is provided in the Department’s WQBEL memo dated June 20, 2018 and the website <http://dnr.wi.gov/topic/wastewater/WETChecklist.html> provides the WET checklist and instructions for its use.) Acute and Chronic WET tests are scheduled in the following rotating quarters: January – March 2020; July – September 2021; October – December 2022; April – June 2023; January – March 2024
- Temperature Maximum:** Available temperature data indicated the apparent need for sub-lethal weekly average temperature limitations for the months of October - February pursuant to the procedures in ch. NR 106, Wis. Adm. Code. Therefore, sub lethal weekly average effluent limitations should be included in the proposed permit. However, ch. NR 106.59(4), Wis. Adm. Code, allows publicly operated treatment works to perform a dissipative cooling (DC) demonstration, which if successful, justifies exclusion of sub lethal weekly average effluent temperature limits in municipal discharge permits. Waukesha has submitted a DC Request Form 3400-198 with the previous permit application. The demonstration included in stream conductivity and temperature data for the Fox (IL) River, upstream and downstream from the outfall. This data showed that although the discharge temperatures may be above the calculated limits, the criteria is not exceeded beyond a small area of mixing and cooling.

The proposed permit includes daily temperature maximum monitoring in the fourth year of the permit, calendar year 2023, and the data collected from this monitoring will be used for the next permit reissuance. In addition, dissipative cooling requests must be re-evaluated every permit reissuance. The permittee is responsible to submit an updated DC request as part of the permit application. Such a request must either include:

- A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or
- New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

3.2 Sample Point Number: 006- EFFLUENT - Root River

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective November - April
BOD5, Total	Weekly Avg	5.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective May - October
BOD5, Total	Monthly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective November - April
BOD5, Total	Monthly Avg	5.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective May - October

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Suspended Solids, Total	Weekly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Year round
Suspended Solids, Total	Monthly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Year round
pH Field	Daily Max	9.0 su	Daily	Grab	Year round. See permit section 3.2.2.3 for additional monitoring requirements.
pH Field	Daily Min	6.0 su	Daily	Grab	Year round. See permit section 3.2.2.3 for additional monitoring requirements.
Fecal Coliform	Geometric Mean - Wkly	848 #/100 ml	3/Week	Grab	Year round monitoring. Limit effective May - September annually.
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	3/Week	Grab	Year round monitoring. Limit effective May - September annually.
Dissolved Oxygen	Daily Min	7.0 mg/L	Daily	Grab	Year round grab sample conducted through remote monitoring.
Nitrogen, Ammonia (NH3-N) Total	Daily Max	13 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective June - February
Nitrogen, Ammonia (NH3-N) Total	Daily Max	15 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective March and May
Nitrogen, Ammonia (NH3-N) Total	Daily Max	16 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	11 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective January
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	12 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective February
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	13 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective March
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	5.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective April
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	5.7 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective May
Nitrogen, Ammonia	Weekly Avg	4.0 mg/L	Daily	24-Hr Flow	Limit effective June

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
(NH3-N) Total				Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	3.3 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective July
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	3.5 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective August
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	4.2 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective September
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	6.7 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective October
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	9.7 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective November
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	9.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective December
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective January
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.1 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective February
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	5.5 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective March
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.4 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective April
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.5 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective May
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective June and September
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.4 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective July
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.5 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective August
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	2.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective October
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit effective November and December
Phosphorus, Total	Monthly Avg	0.18 mg/L	Daily	24-Hr Flow Prop Comp	Year round
Phosphorus, Total	6-Month Avg	0.06 mg/L	Daily	24-Hr Flow	Year round. See section 6.4.2 for six-month average

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
				Prop Comp	calculation and reporting.
Phosphorus, Total	6-Month Avg	4.65 lbs/day	Daily	Calculated	Year round. See section 6.4.2 for six-month average calculation and reporting.
Chloride	Weekly Avg	620 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit effective December - April. the final weekly and monthly average limit of 400 mg/L become effective 3 years from the final transition to the Lake Michigan water supply. See schedules section 5.3.
Chloride	Weekly Avg	570 mg/L	4/Month	24-Hr Flow Prop Comp	This is an interim limit effective May - November. The final weekly and monthly average limit of 400 mg/L become effective 3 years from the final transition to the Lake Michigan water supply. See schedules section 5.3.
Chloride		lbs/day	4/Month	Calculated	Monitoring only. The final weekly average mass limit of 31,000 lbs/day becomes effective 3 years after the commencement of discharge. See Schedules section 5.3.
Cadmium, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	See section 3.2.2.2 below.
Chromium, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	See section 3.2.2.2 below.
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	See section 3.2.2.2 below.
Lead, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	See section 3.2.2.2 below.
Nickel, Total Recoverable		ug/L	Quarterly	24-Hr Flow Prop Comp	See section 3.2.2.2 below.
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	See section 3.2.2.2 below.

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Mercury, Total Recoverable		ng/L	Monthly	Grab	See Mercury section 3.2.2.4 below.
Mercury, Total Recoverable		grams/month	Monthly	Grab	See permit section 3.2.2.5 for calculation.
Mercury, Total Recoverable		grams/yr	Annual	Calculated	Report the sum of the total monthly effluent mass loading for the calendar year on the Annual report form. See section 3.2.2.3 below.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See WET permit section 3.2.2.7.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See WET permit section 3.2.2.7.
Temperature Maximum		deg F	3/Week	Continuous	Monitoring in calendar year 2023. (January 1 – December 31)

3.2.1 Changes from Previous Permit

Outfall 006 was added to the proposed permit to include permit requirements for the return flow discharge to the Root River. Commencement of Discharge shall be defined as the time when the City of Waukesha has completed the transition to the Lake Michigan water supply and return flow to the Root River.

3.2.2 Explanation of Limits and Monitoring Requirements

Refer to the Water Quality-Based Effluent Limitations (WQBELs) memo for the City of Waukesha prepared by Nick Lent dated June 20, 2019, revised August 13, 2019 and the Antidegradation Evaluation for the proposed Root River discharge prepared by Andrew Dutcher dated May 29, 2019, revised August 7, 2019 and used for this reissuance.

- BOD₅:** Standard municipal wastewater requirements for BOD₅, are included in ch. NR 210, Wis. Adm. Code ‘Sewage Treatment Works’ requirements for discharges to fish and aquatic life receiving waters. To prevent a significant lowering of water quality the most stringent BOD₅ limits currently set by the Department are included for the proposed discharge. These limits are 5.0 mg/L (May-October) and 10 mg/L (November – April) and are consistent with the “Effluent Limits below 10 mg/L” guidance.
- Total Suspended Solids:** Section NR 102.014, Wis. Adm. Code, allows the Department to set effluent limits to prevent objectionable deposits on shores or beds of receiving waters. In the absence of any wasteload allocation(s) from a total maximum daily load (TMDL), TSS limitations are established at the same levels as the calculated BOD₅ limitations, except that the weekly and monthly average limits shall not be set lower than 10 mg/L during any time. Therefore, a weekly average limit of 10 mg/L is included for discharge to the Root River and a monthly average limit of 10 mg/L is included to satisfy effluent limit expression requirements.

- pH Field and Fecal Coliform:** Standard municipal wastewater requirements for pH and fecal coliforms are included based on ch. NR 210, Wis. Adm. Code ‘Sewage Treatment Works’ requirements for discharges to fish and aquatic life receiving waters. Chapter NR 102, Wis. Adm. Code ‘Water Quality Standards for Surface Waters’ also specifies requirements for pH for fish and aquatic life.

Regulatory changes to s. NR 205.065, Wis. Adm. Code, became effective September 1, 2016 and require limits in this permit to be expressed as weekly average and monthly average limits whenever practicable. These changes are based on 40 CFR 122.45(d).
- Additional pH Monitoring:** The permittee shall submit a report in accordance with the schedule in section 5.4 of the permit. The additional pH monitoring in is include in the proposed permit to determine if there is a migration in the data recorded at the Clean Water Plant versus downstream at the discharge to the Root River.
- Dissolved Oxygen:** To ensure the assumptions of the BOD 26-lb method are met, a daily minimum year-round DO limit of 7.0 mg/L is included. See pages 18 and 19 of the WQBEL memo for a complete discussion along with the DO portion of the Antidegradation Evaluation.
- Ammonia Total Nitrogen:** Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Table 2C and Table 4B of ch. NR 105, Wis. Adm. Code (effective March 1, 2004). Subchapter IV of ch. NR 106 establishes procedures for calculating water quality-based effluent limitations (WQBELs) for ammonia (effective March 1, 2004). The facility has demonstrated the ability to meet the lower set of calculated daily maximum limits as discussed in Part 3 of the WQBEL memo, therefore the lower limits are included for the proposed discharge. Weekly average and monthly average limits are included to protect the chronic toxicity criteria.
- Total Phosphorus:** In the absence of a total maximum daily load (TMDL) and based on analysis provided by the City, six-month average limits of 0.060 mg/L and 4.65 lbs/day are included for the proposed discharge. See Part 5, pages 20-24 of the WQBEL memo for a complete discussion.
- Chloride:** Using available effluent data from the current permit term Outfall 001 (August 2013 – February 2019), the 1-day P99 chloride concentration is 659 mg/L, and the 4-day P99 is 594 mg/L. Because the 4-day P99 exceeds the calculated weekly average WQBEL and because this is new discharge and there is reasonable potential to exceed effluent limitations, a weekly average limit of 400 mg/L is required for Outfall 006. Since Waukesha’s current treatment system is not designed to remove chlorides and installing treatment is not economically feasible, the City will be implementing a two-phase chloride source reduction program as outlined in the 2017 SRM plan submitted with the permit application for reissuance. The first phase will be implemented prior to the commencement of discharge to the Root River and the second phase will be implemented after the transition to the new water supply is completed. Based on information provided by the City, it is expected that Waukesha can reasonably, and cost effectively comply with the weekly average effluent limit of 400 mg/L within three years of final transition to the Lake Michigan water supply. Weekly average interim limitations of 560 mg/L (December-April) and 530 mg/L (May-November) are included in the proposed permit in order to hold the permittee to a discharge quality no less than what is currently being discharged and are effective at the commencement of discharge at Outfall 006. These interim limits are effective until either updated interim limits are calculated for the next permit reissuance or the final weekly average limit of 400 mg/L is effective per the compliance schedule in section 5.3 of the permit.
- Cadmium, Chromium, Copper, Lead, Nickel and Zinc:** Since Waukesha is a control authority subject to state and federal pretreatment requirements, the proposed permit will continue to include quarterly monitoring of effluent for cadmium, chromium, lead, and nickel and monthly monitoring for copper and zinc.
- Mercury:** The facility currently discharges effluent mercury concentrations sufficiently below the most stringent criterion for mercury and meets the requirements of s. NR 207.04(1)(d)2.b, s. NR 207.04(2)(b)1., and s. NR 102.12(2), and s. NR 106.05, Wis. Adm. Code, as explained in the Antidegradation Evaluation. Therefore, a limit is not currently included for the proposed permit. However, monthly monitoring and annual mass reporting of the

water supply and effluent along with a reopener clause in section 3.2.2.5 of the proposed permit are included to satisfy requirements of 40 C.F.R., Pt. 132, App. E. II. D. 2.

The conversion factor in the equation in permit section 3.2.2.5, used to derive the mass of mercury in grams/month was determined using the following equation;

$$\frac{1 \text{ mg/L}}{1000000 \text{ ng/L}} \times 8.34 \times \frac{453.6 \text{ grams}}{1 \text{ lb}} = 0.00378$$

- Acute and Chronic WET:** Whole Effluent Toxicity (WET) testing requirements are determined in accordance with ss. NR 106.08 and NR 106.09, Wis. Adm. Code. See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist. The WET Guidance Document was used to determine appropriate test frequencies. (A completed checklist for outfall 001 is provided in the Department’s WQBEL memo dated June 20, 2018 and the website <http://dnr.wi.gov/topic/wastewater/WETChecklist.html> provides the WET checklist and instructions for its use.) Acute and Chronic WET tests are scheduled in the following rotating quarters: April – June 2023; January – March 2024
- Temperature Maximum:** Available temperature data indicated the apparent need for sub-lethal weekly average temperature limitations for the months of October - February pursuant to the procedures in ch. NR 106, Wis. Adm. Code. Therefore, sub lethal weekly average effluent limitations should be included in the proposed permit. However, ch. NR 106.59(4), Wis. Adm. Code, allows publicly operated treatment works to perform a dissipative cooling (DC) demonstration, which if successful, justifies exclusion of sub lethal weekly average effluent temperature limits in municipal discharge permits. Waukesha has submitted a DC Request Form 3400-198 for the return flow discharge with the permit application. The submittal included estimates of temperature loss between the Clean Water Plant and the point of discharge to the Root River as well as an analysis of how far downstream from the discharge criteria would be met. This information showed that the discharge will not cause or contribute to an exceedance of the sub-lethal criteria beyond a small area of mixing and cooling.

The proposed permit includes daily temperature maximum monitoring in the fourth year of the permit, calendar year 2023, and the data collected from this monitoring will be used for the next permit reissuance. In addition, dissipative cooling requests must be re-evaluated every permit reissuance. The permittee is responsible to submit an updated DC request as part of the permit application. Such a request must either include:

- A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or
- New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

4 Land Application - Proposed Monitoring and Limitations

Municipal Sludge Description						
Sample Point	Sludge Class (A or B)	Sludge Type (Liquid or Cake)	Pathogen Reduction Method	Vector Attraction Method	Reuse Option	Amount Reused/Disposed (Dry Tons/Year)
002	B	Cake	Fecal Coliform	Incorporation	Land Application	1,352 dry U.S. Tons
005	B	Liquid	Fecal Coliform	Hauled to another facility or injection when land applied.		200 dry U.S. Tons

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)
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? Yes. 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: 002- Cake Sludge

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	

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
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	Quarterly	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Monitor once in calendar year 2020.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	Monitor once in calendar year 2020.
Municipal Sludge Priority Pollutant Scan			Once	Composite	As specified in s. NR 215.03 (1-4), Wis. Adm. Code. Monitor once in calendar year 2020.

4.1.1 Changes from Previous Permit:

Based on the volume of sludge generated and reported on the eDMRs and as listed in the permit application, previous sample frequencies of once every two months were reduced to quarterly. The municipal sludge priority pollutant scan is required once during calendar year 2020 (January 1, 2020 – December 31, 2020).

4.1.2 Explanation of Limits and Monitoring Requirements

Requirements for 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.

Land application of waste shall be done in accordance with the permit conditions and applicable codes. All land application sites shall be approved prior to their use. To receive a list of approved sites, or to be notified of potential approvals, contact the WDNR compliance staff.

4.2 Sample Point Number: 005- Liquid Sludge

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Solids, Total		Percent	Annual	Composite	See permit section 4.2.2.1
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	See permit section 4.2.2.1
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	See permit section 4.2.2.1
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	See permit section 4.2.2.1
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	See permit section 4.2.2.1
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	See permit section 4.2.2.1
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	See permit section 4.2.2.1
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	See permit section 4.2.2.1
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	See permit section 4.2.2.1
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	See permit section 4.2.2.1
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	See permit section 4.2.2.1
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	See permit section 4.2.2.1
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	See permit section 4.2.2.1
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	See permit section 4.2.2.1
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	See permit section 4.2.2.1
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	See permit section 4.2.2.1
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	See permit section 4.2.2.1
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	See permit section 4.2.2.1
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	See permit section 4.2.2.1
Nitrogen, Ammonium (NH ₄ -N) Total		Percent	Annual	Composite	See permit section 4.2.2.1
Phosphorus, Total		Percent	Annual	Composite	See permit section 4.2.2.1
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	See permit section 4.2.2.1
Potassium, Total Recoverable		Percent	Annual	Composite	See permit section 4.2.2.1
Radium 226 Dry Wt		pCi/g	Annual	Composite	

4.2.1 Changes from Previous Permit:

Associated limits, monitoring, and land application requirements for Sample Point 005 were added to the proposed permit to allow the permittee to land apply sludge from this outfall if needed.

4.2.2 Explanation of Limits and Monitoring Requirements

The permittee is not required to analyze for Total Kjeldahl Nitrogen, Ammonium, Total Phosphorus, Water Extractable Phosphorus, Total Recoverable Potassium, pathogens, and vector attraction parameters unless land application of sludge is initiated. As long as landfilling or hauling to another permitted facility are the sole disposal methods, only List 1 analysis is required. The metals limits in the table above do not apply to landfilled sludge. Monitoring for landfilled sludge may remain at Annual as long as that is the sole method of disposal. If sludge is land applied the sample frequency may increase based on the amount of sludge generated in accordance with Table A in s. NR 204.06, Wis. Adm. Code, and all limits and monitoring requirements listed in the table apply.

Requirements for 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.

5 Schedules

5.1 Water Quality Based Effluent Limits for Total Phosphorus-Fox River (Outfall 001)

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

Required Action	Due Date
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades.	06/30/2020
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades.	06/30/2021
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades.	05/31/2022
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs.	06/30/2022

5.1.1 Explanation of Schedule

Water Quality Based Effluent Limits for Total Phosphorus – Fox River (Outfall 001)

This compliance schedule requires the permittee to continue to optimize phosphorus removal at the treatment plant and submit progress reports on the status of achieving compliance with the final water quality based effluent limits.

5.2 Chloride Target Value - Fox River (Outfall 001)

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
<p>Annual Chloride Progress Report: Submit an annual chloride progress report. The annual chloride progress report shall:</p> <p>Indicate which chloride source reduction measures or activities in the approved Source Reduction Plan have been implemented;</p> <p>Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and</p> <p>Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system.</p> <p>Note that the interim limitations of 620 mg/L (December through April) and 570 mg/L (May through November) remain enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Due Date.</p>	01/31/2020
<p>Annual Chloride Progress Report #2: Submit the chloride progress report as defined above.</p>	01/31/2021
<p>Annual Chloride Progress Report #3: Submit the chloride progress report as defined above.</p>	01/31/2022
<p>Annual Chloride Progress Report #4: Submit the chloride progress report as defined above.</p>	01/31/2023
<p>Final Chloride Report: Submit the final chloride report documenting the success in meeting the chloride target values of 560 mg/L (December through April) and 530 mg/L (May through November), as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the approved Source Reduction Plan were not pursued and why. The report shall include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data covering the current permit term. The report shall also include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system.</p> <p>Additionally, the report shall include proposed target values and source reduction measures for negotiations with the department if the permittee intends to seek a renewed chloride variance per s. NR 106.83, Wis. Adm. Code, for the reissued permit.</p> <p>Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures, but is not an enforceable limitation under the terms of this permit.</p>	01/31/2024
<p>Annual Chloride Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual chloride reports each year covering source reduction measures implemented and chloride concentration and mass discharge trends.</p>	

5.2.1 Explanation of Schedule

Chloride Target Value – Fox River (Outfall 001)

This schedule is a condition of receiving a variance from the chronic water quality-based chloride limit of 410 mg/L. Since a schedule is being granted, an interim limit is required, and for the Waukesha the limits are established as 620 mg/L (December-April) and 570 mg/L (May-November). The schedule requires that annual reports shall indicate which

source reduction measures the permittee has implemented during each calendar year, and an analysis of chloride concentration and mass discharge data based on chloride sampling and flow data. The annual reports shall document progress made towards meeting the chloride target value of 560 mg/L (December-April) and 530mg/L (May-November) by the end of the permit term.

5.3 Water Quality Based Effluent Limits for Chloride - Root River (Outfall 006)

The permittee shall comply with the WQBELS for Chloride, for the Root River discharge at Outfall 006, as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance.

Required Action	Due Date
<p>Chloride Progress Report #1: Submit a chloride progress report. The chloride progress report shall include: the chloride source reduction measures or activities that have been implemented; an analysis of trends in weekly and monthly average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and the actions the permittee plans to take to achieve compliance with the final chloride water quality based effluent limits.</p> <p>The progress report shall be submitted no later than 1-year after the final transition to the Lake Michigan water supply.</p>	
<p>Chloride Progress Report #2: Submit the chloride progress report as defined above.</p> <p>The progress report shall be submitted no later than 2-years after the final transition to the Lake Michigan water supply.</p>	
<p>Achieve Compliance: The permittee shall achieve compliance with the final water quality-based chloride effluent limitations of 400 mg/L as a weekly and monthly average and 31,000 lbs/day as a weekly average.</p> <p>Compliance with the final limits shall be achieved no later than 3-years after the final transition to the Lake Michigan water supply.</p>	

5.3.1 Explanation of Schedule

Water Quality Based Effluent Limits for Chloride – Root River (Outfall 006)

Based on information provided by the City, it is expected that Waukesha can reasonably, and cost effectively comply with the weekly average effluent limits of 400 mg/L and 31,000 lbs/day within three years of final transition to the Lake Michigan water supply. This compliance schedule is included to track the progress Waukesha is making towards the final limits. Since a compliance schedule is being granted, an interim limit is required, and for Waukesha the limits are established as 620 mg/L (December-April) and 570 mg/L (May-November). The schedule requires that annual reports shall indicate which source reduction measures Waukesha has implemented during each calendar year, and an analysis of chloride concentration and mass discharge data based on chloride sampling and flow data. The annual reports shall document progress made towards meeting the chloride target value of 560 mg/L (December-April) and 530mg/L (May-November) by the end of the permit term.

5.4 Additional pH Monitoring Analysis

Required Action	Due Date
<p>Data Analysis Report Submittal: The permittee shall submit a report summarizing all recorded grab sample data along with the change in pH between the Clean Water Plant and the discharge site. The</p>	06/30/2024

report should include a list of all sample dates and pH results for the Root River sample location, and provide a conclusion based on the data evaluation.	
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5.4.1 Explanation of Schedule

Additional pH Monitoring Analysis

The permittee shall conduct additional pH monitoring at the Root River discharge site after aeration. The permittee shall submit a report with a summary of all recorded grab sample data and also include in the report the change in pH between discharge site and Clean Water Plant. The report should discuss any correlation between the two sample locations and provide conclusions based on the evaluation.

5.5 Land Application Management Plan

A management plan is required for the land application program.

Required Action	Due Date
<p>Land Application Management Plan Submittal: Submit a 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.</p>	03/31/2020

5.5.1 Explanation of Schedule

Land Application Management Plan

Subsection NR 204.11(1), Wis. Adm. Code, allows the Department to require a land application management plan. This compliance schedule requires Waukesha to submit a management plan for Department approval and is due March 31, 2020. The management plan is being required as the first step in addressing, reviewing and analyzing the management of the biosolids land application program.

Attachments:

Substantial Compliance Determination – dated April 5, 2019 and prepared by Nick Lent, WDNR Wastewater Engineer

Water Quality Based Effluent Limits – dated June 20, 2019, revised August 13, 2019 and prepared by Nick Lent, WDNR Wastewater Engineer

NR 207 Antidegradation Evaluation – dated May 29, 2019, revised November 26, 2019 and prepared by Andrew Dutcher, WDNR Wastewater Engineer

Proposed Expiration Date:

December 31, 2024

Justification Of Any Waivers From Permit Application Requirements

The Department recognizes that the discharge to the Root River is in the preliminary design phase and understands that the permittee may not be able to provide exact information for some of the permit application questions related specifically to Outfall 006 (proposed Root River return flow). The permittee shall answer all questions and can use phrases such as; “under development”, “in design phase”, “proposed to be..”, “anticipated”, etc.

Prepared By:

Laura Dietrich, WDNR - Wastewater Specialist, Advanced

Date: July 17, 2019

Updated after Fact Check: August 20, 2019

Updated after Public Notice: December 4, 2019