Permit Fact Sheet

General Information

Permit Number	WI-0037991-08-0
Permitted Facility Name and Addresses	ND WQC LLC 2731 Fifth Avenue North Wisconsin Rapids, WI 54495 The Biron Mill 621 N Biron Dr Wisconsin Rapids, WI 54494
Permit Term	August 01, 2025 to July 31, 2030
Discharge Location	001: Lat: 44.40225° N, Lon: 89.82442° W 003: Lat: 44.41751° N, Lon: 89.83609° W 005: Lat: 44.42283° N, Lon: 89.82686° W 006: Lat: 44.42718° N, Lon: 89.83093° W 007: Lat: 44.42255° N, Lon: 89.83696° W 011: Lat: 44.42804° N, Lon: 89.78343° W 012: Lat: 44.42943° N, Lon: 89.78298° W 013: Lat: 44.43104° N, Lon: 89.78008° W 018: Lat: 44.42814° N, Lon: 89.78378° W
Receiving Water	Wisconsin River in Wood County
Stream Flow ($Q_{7,10}$)	999 cfs
Stream Classification	Warmwater Sport Fishery
Discharge Type	Continuous

Facility Description

Wisconsin Rapids Paper Mill and Wisconsin Rapids Fiber and Energy: In the fall of 2007, Stora Enso Oyj sold its North American coated paper operations to Ohio-based NewPage Holding Corporation. Included in the sale was a headquarters building in Wisconsin Rapids, a research and development center in Biron, and mills in Kimberly, Niagara, Stevens Point, Whiting as well as Wisconsin Rapids. Stora Enso retained ownership of Corenso, a paperboard mill and core plant that was part of the Wisconsin Rapids Paper Mill. In 2007 NewPage changed the company name to NewPage Wisconsin System, Inc. In 2005 Stora Enso combined the Wisconsin Rapids pulp and paper mills into the Wisconsin Rapids Mill with business units of Wisconsin Rapids Fiber and Energy and Wisconsin Rapids Paper Mill. NewPage sold its North American paper operations to Verso in January 2015. Verso idled operations at the Wisconsin Rapids Mill in 2020. Verso was then acquired by BillerudKorsnäs AB in July 2022, who then sold the Wisconsin Rapids Paper Mill (WRM) and the Wisconsin Rapids Fiber and Energy (WRFE) Center to PCR Rapids 1 Op LLC in July 2024. As of the date of this fact sheet, PCR Rapids has idled production at both WRM and WRFE.

Historically, groundwood and thermal-mechanical pulps and light- and medium- weight coated paper were produced at the Biron Mill, bleached kraft pulp were produced at Wisconsin Rapids Fiber and Energy, and medium- to heavy-weight, wood-free coated paper were produced at Wisconsin Rapids Paper Mill.

ND Paper LLC – Biron Mill: In 2015, the Biron Mill was sold by New Page to Catalyst Paper. Catalyst then sold the facility to ND Paper in 2018. The Biron Mill has two paper machines, PM 25 and PM 26, and four off-machine coaters.

Paper Machine 26 was rebuilt in February 2005. In August of 2020, No. 25 Paper Machine was converted from a lightweight coated paper machine to linerboard and corrugated medium machine. The machine is capable of utilizing 100% Old Corrugated Container (OCC), 100% mixed paper pulp or any combination. The pulp is supplied by an onsite hydra-pulper. Paper Machine 26 made white kraft paper until April of 2023 when it was converted to produce recycled packaging products.

The Biron Mill also operates a filtration plant to treat intake water from the Wisconsin River, utilizes five boilers to generate steam and four turbines to produce 40 percent of the electrical power required by the mill. In 2008 a new steam condenser for excess steam resulting from swings in paper machine operation was installed.

Sonoco Products Wisconsin Rapids – Board Machine 12: Corenso took ownership of Consolidated Papers' paperboard mill and core plant when Stora Enso acquired Consolidated Papers in 2000. Under the name "Corenso North America," Corenso used recycled wastepaper, paperboard and cardboard to create paperboard that is wound into a core and used as the center of large paper rolls. The original acquisition included paper machine BM 12 and paperboard machine BM 13. While PM 12 was shut down in January 2003, it was subsequently rebuilt, converted to a board machine and restarted during the first quarter of 2008. Rebuilt BM 12 increased paperboard production at the Corenso facility from 103 TPD to 265 TPD even though BM 13 was shut down at the end of 2008. Sonoco Products ('Sonoco') has since acquired BM 12.

Sonoco continues to discharge its process wastewaters generated from BM 12 to ND WQC LLC, which is located just northwest of Wisconsin Rapids.

Wastewater Sources: The Biron Mill and Sonoco discharge process wastewaters to the Water Quality Center (ND WQC LLC) for treatment. Both production facilities discharge cooling waters directly to the Wisconsin River and each operates a wastewater lift station with an outfall for emergency overflows. Leachate and groundwater from the ND WQC LLC Landfill, which is located adjacent to the Water Quality Center, are also treated at ND WQC LLC. Leachate from the closed F&E Landfill is pumped to ND WQC LLC for treatment.

All sanitary wastes from the mills are discharged to the Wisconsin Rapids municipal wastewater treatment system.

Water Quality Center: Water Quality Center was sold by BillerudKorsnäs AB to ND WQC LLC in 2024. The facility provides pH neutralization, primary clarification, extended aeration activated sludge, secondary clarification and sludge dewatering. Components of ND WQC LLC include three primary clarifiers, three lagoons (48 MG, 24 MG, and 12 MG) with surface aerators, two secondary clarifiers, two sludge thickeners and four belt presses. The smallest aerated lagoon (No. 2) is used to store spills that occur in the mills. Dewatered sludge is either landfilled in the adjacent, company-owned landfill or landspread.

Substantial Compliance Determination

A Notice of Noncompliance was issued to ND Paper, Inc in July of 2023 for spills occurring at the Biron Mill. This was followed by a Notice of Violation issued in April of 2024 as spills continued to occur. The facility has taken several steps to address the spills including new shutdown procedures for the 700-ton machine, updated operational procedures for the 700-ton machine, and new spill response plans. The facility has also committed to determining the root cause of each spill that occurs and continuing to address issues. The facility has since idled the 700-ton machine that was responsible for the majority of the spills (due to market conditions, unrelated to the spills) and has reported only one spill since March of 2024. No other formal enforcement actions have been taken against these facilities since the issuance of the current permit.

After a desk top review of all: discharge monitoring reports, land app reports, compliance schedule items, and site visits, these facilities have been found to be in substantial compliance with their current permit. A site visit of the Water Quality Center, Wisconsin Rapids Mill, and Sonoco BM12 was conducted 10/10/2023 by Logan Rubeck. A site visit of ND Paper Biron Mill was conducted on 6/13/2023 by Jenna Monahan.

Compliance determination made by Logan Rubeck, Wastewater Engineer on 1/27/2024.

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)**
601	N/A	Sampling Point 601 represents the point upstream of the Biron Mill where mercury is monitored in the Wisconsin River
701	0.55 MGD (2018 – 2022)	Sampling Point 701 represents the Biron Mill Accelator Intake.
702	0.27 MGD (2016 – 2019)	Sampling Point 702 represents the Biron Mill Main River Water System Intake.
703	7.04 MGD (2018 – 2022)	Sampling Point 703 represents the Biron Mill 45# Steam Condenser Intake.
704	11.31 MGD (2018 – 2022)	Sampling Point 704 represents the Biron Mill Boiler House 24-Inch Intake.
705	28.37 MGD (2018 – 2022)	Sampling Point 705 represents the Biron Mill Boiler House 48-Inch Intake.
709	Not Used.	Sampling Point 709 represents the Wisconsin Rapids Emergency Fire Intake
001	11.2 MGD (2020 – 2024)	At Water Quality Center Sampling Point 001, Water Quality Center final effluent shall be sampled prior to discharge to the Wisconsin River via Outfall 001.
003	0.23 MGD (2020 – 2024)	At Water Quality Center Sampling Point 003, groundwater from beneath the liner of the Water Quality Center's Aeration Basin 3 shall be monitored prior to discharge via Outfall 003 to a ditch that flows to Cranberry Creek (WQC).
005	0.05 MGD (2020 – 2024)	At Water Quality Center Sampling Point 005 (816), groundwater from beneath the liners of Areas 3, 4 and 5 of the Water Quality Center's landfill shall be monitored prior to discharge via Outfall 005 to a mitigated wetland near 5th Avenue.
006	No Discharge.	At Water Quality Center Sampling Point 006 (822), groundwater from beneath the liners of Areas 6 and 7 of the Water Quality Center's landfill shall be monitored prior to discharge via Outfall 006 to a ditch that flows to Cranberry Creek (WQC). PLACEHOLDER: DEPARTMENT APPROVAL REQUIRED PRIOR TO INITIAL USE.
007	No monitoring.	Water Quality Center Sampling Point 007 represents uncontaminated runoff from Areas 6 and 7 of the Water Quality Center's landfill prior to discharge from the sedimentation basin to a ditch that flows to Cranberry Creek (WQC). NO MONITORING REQUIRED.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
011	22 MGD (2020 – 2024)	Biron Mill Sampling Point 011 represents the combined discharge of PM 25 deaerator vacuum pump seal water and PM 25 vacuum pump seal water prior to discharge to the Wisconsin River via Outfall 011.
012	12.1 MGD (2020 – 2024)	At Biron Mill Sampling Point 012, noncontact cooling waters (boiler house condenser, oil heat exchanger and other sources) and roof drainage (kraft pulp receiving and OMC buildings), if present, shall be monitored after mixing, but prior to discharging to the Wisconsin River via Outfall 012.
013	7 MGD (2020 – 2024)	At Biron Mill Sampling Point 013, noncontact cooling waters (groundwood and thermo-mechanical pulping, whitewater and oil heat exchangers, 45# Steam Condenser, and all other sources), Wisconsin River intrusion water and stormwater, if present, shall be monitored after mixing, but prior to discharging to the Wisconsin River via Outfall 013.
018	4.4 MGD (2020 – 2024)	Biron Mill Sampling point 018 represents the combined discharge of PM 26 deaerator vacuum pump seal water and PM 26 vacuum pump seal water prior to discharge to the Wisconsin River via Outfall 018.
099		At Water Quality Center Sampling Point 099, wastewater treatment system sludge from the Water Quality Center shall be sampled prior to land application via Outfall 099.
113	N/A	Sampling Point 113 represents the field blank that accompanies mercury monitoring at the Biron Mill.
114	N/A	Sampling Point 114 represents the field blank that accompanies mercury monitoring at the Water Quality Center.

Changes from Previous Permit:

The following sampling points/outfalls were **removed** from this permit:

Influent Sampling Points:

- Sampling point 706 – Wisconsin Rapids Fiber and Energy Filter Plant Intake 1. Idled since 7/2020.

    - See Appendix B for the BTA determination for this intake structure (under WRM intake BTA) using historical flow rates.
- Sampling point 707 – Wisconsin Rapids Fiber and Energy Filter Plant Intake 2. Idled since 7/2020.
    - See Appendix B for the BTA determination for this intake structure (under WRM intake BTA) using historical flow rates.
- Sampling point 708 – Wisconsin Rapids Fiber and Energy Surface Condenser Intake 3. Idled since 2020.
    - See Appendix B for the BTA determination for this intake structure (under WRM intake BTA) using historical flow rates.
- Sampling point 710 – Wisconsin Rapids Condenser Intake. Not in use since 2004.
- Sampling point 711 – Active. Wisconsin Rapids Paper Mill North Intake. Moved to Sonoco's WPDES permit.
    - See Appendix B for the BTA determination for this intake structure (under WRM intake BTA).
- Sampling point 712 – Active. Wisconsin Rapids Paper Mill South Intake. Moved to Sonoco's WPDES permit.
    - See Appendix B for the BTA determination for this intake structure (under WRM intake BTA).

In-Plant Sampling Points:

- Sampling Point 104 - Wisconsin Rapids Fiber and Energy Bleach Line 1 acid effluent prior to combining with caustic effluent.
    - Sampling point has been removed due to WRFE being idled.
- Sampling Point 105 - Wisconsin Rapids Fiber and Energy Bleach Line 1 caustic effluent prior to combining with acid effluent.
    - Sampling point has been removed due to operations at WRFE being idled.
- Sampling Point 106 - Wisconsin Rapids Fiber and Energy Bleach Line 1 acid and caustic effluents.
    - Sampling point has been removed due to operations at WRFE being idled.
- Sampling Point 107 - Wisconsin Rapids Fiber and Energy Bleach Line 2 acid effluent prior to combining with caustic effluent.
    - Sampling point has been removed due to operations at WRFE being idled.
- Sampling Point 108 - Wisconsin Rapids Fiber and Energy Bleach Line 2 caustic effluent prior to combining with acid effluent.
    - Sampling point has been removed due to operations at WRFE being idled.
- Sampling Point 109 - Wisconsin Rapids Fiber and Energy combined Bleach Line 2 acid and caustic effluents.
    - Sampling point has been removed due to operations at WRFE being idled.
- Sampling Point 110 - At Wisconsin Rapids Fiber and Energy in-plant Sampling Point 110, pulp mill caustic effluent shall be sampled prior to combining with other waste streams.
    - Sampling point has been removed due to operations at WRFE being idled.
- Sampling Point 125 - PM 25 deaerator vacuum pump seal water prior to mixing with all other wastewaters that are discharged to the Wisconsin River via Outfall 011.
    - Sampling point has been removed due to monitoring moved to Outfall 011. These sampling points existed previously for reporting purposes as it's infeasible to sample Outfall 011 directly for parameters other than temperature and it's much easier to sample the two lines from the paper machine directly then composite them. The way in which a sample is collected has not changed from existing operations, but these sampling points were removed to avoid confusion as far as reporting purposes go. A permit condition was added to clarify how samples should be taken and reported going forward.
- Sampling Point 126 - PM 25 vacuum pump seal water prior to mixing with all other wastewaters that are discharged to the Wisconsin River via Outfall 011.
    - Sampling point has been removed due to monitoring moved to Outfall 011. These sampling points existed previously for reporting purposes as it's infeasible to sample Outfall 011 directly for parameters other than temperature and it's much easier to sample the two lines from the paper machine directly then composite them. The way in which a sample is collected has not changed from existing operations, but

these sampling points were removed to avoid confusion as far as reporting purposes go. A permit condition was added to clarify how samples should be taken and reported going forward.

- Sampling Point 127 - PM 26 deaerator vacuum pump seal water prior to mixing with all other wastewaters that are discharged to the Wisconsin River via Outfall 018.
  - Sampling point has been removed due to monitoring moved to Outfall 018. These sampling points existed previously for reporting purposes as it's infeasible to sample Outfall 018 directly for parameters other than temperature and it's much easier to sample the two lines from the paper machine directly then composite them. The way in which a sample is collected has not changed from existing operations, but these sampling points were removed to avoid confusion as far as reporting purposes go. A permit condition was added to clarify how samples should be taken and reported going forward.
- Sampling Point 128 - PM 26 vacuum pump seal water prior to mixing with all other wastewaters that are discharged to the Wisconsin River via Outfall 018.
  - Sampling point has been removed due to monitoring moved to Outfall 018. These sampling points existed previously for reporting purposes as it's infeasible to sample Outfall 018 directly for parameters other than temperature and it's much easier to sample the two lines from the paper machine directly then composite them. The way in which a sample is collected has not changed from existing operations, but these sampling points were removed to avoid confusion as far as reporting purposes go. A permit condition was added to clarify how samples should be taken and reported going forward.
- Sampling Point 129 - Wisconsin Rapids Paper Mill BM 12 vacuum pump seal water prior to mixing with all other wastewaters that are discharged to the Wisconsin River via Outfall 015.
  - Sampling point has been removed from this permit due to Outfall 015 moving to Sonoco's permit.
- Sampling Point 130 - Wisconsin Rapids Paper Mill PM 14 vacuum pump seal water prior to mixing with all other wastewaters that are discharged to the Wisconsin River via Outfall 015.
  - Sampling point has been removed from this permit due to PM 14 being idled and Outfall 015 moving to Sonoco's permit.
- Sampling Point 131 - Wisconsin Rapids Paper Mill PM 16 vacuum pump seal water prior to mixing with all other wastewaters that are discharged to the Wisconsin River via Outfall 019.
  - Sampling point has been removed from this permit due to PM 16 being idled.

Surface Water Sampling Points/Outfalls:

- Sampling Point/Outfall 014 - Emergency overflow of the Biron Mill process wastewater prior to discharging to the Wisconsin River.

  - Given their infrequent usage, all emergency overflow sampling points/outfalls and calculated outfalls containing emergency outfall reported results documented in this permit (014, 016, 020, 022, and 023) have been removed from the permit itself to avoid confusion and reduce reporting requirements, as discharges from those outfalls are unpermitted discharges and handled through the Bypass standard requirements when they do occur.

- Sampling Point/Outfall 016 - Emergency overflow of the process Wisconsin Rapids Mill paper wastewater prior to discharge to the Wisconsin River.

  - Given their infrequent usage, all emergency overflow sampling points/outfalls and calculated outfalls containing emergency outfall reported results documented in this permit (014, 016, 020, 022, and 023) have been removed from the permit itself to avoid confusion and reduce reporting requirements, as discharges from those outfalls are unpermitted discharges and handled through the Bypass standard requirements when they do occur.

- Sampling Point/Outfall 020 - Emergency overflow of the Wisconsin Rapids Fiber and Energy process wastewater lift station shall be monitored prior to discharge to the Wisconsin River.
    - Given their infrequent usage, all emergency overflow sampling points/outfalls and calculated outfalls containing emergency outfall reported results documented in this permit (014, 016, 020, 022, and 023) have been removed from the permit itself to avoid confusion and reduce reporting requirements, as discharges from those outfalls are unpermitted discharges and handled through the Bypass standard requirements when they do occur.
- Sampling Point 022 - Combined loadings from Water Quality Center final effluent at Sampling Point 001, Wisconsin Rapids Fiber and Energy lift station overflow at Sampling Point 020, Biron Mill lift station overflow at Sampling Point 014, and Wisconsin Rapids Paper Mill lift station overflow at Sampling Point 016.
    - Given their infrequent usage, all emergency overflow sampling points/outfalls and calculated outfalls containing emergency outfall reported results documented in this permit (014, 016, 020, 022, and 023) have been removed from the permit itself to avoid confusion and reduce reporting requirements, as discharges from those outfalls are unpermitted discharges and handled through the Bypass standard requirements when they do occur.
- Sampling Point/Outfall 023 - Water Quality Center Sampling Point 023 represents combined loadings from Water Quality Center final effluent at Sampling Point 001 and Wisconsin Rapids Fiber and Energy lift station overflow at Sampling Point 020.
    - Given their infrequent usage, all emergency overflow sampling points/outfalls and calculated outfalls containing emergency outfall reported results documented in this permit (014, 016, 020, 022, and 023) have been removed from the permit itself to avoid confusion and reduce reporting requirements, as discharges from those outfalls are unpermitted discharges and handled through the Bypass standard requirements when they do occur.
- Sampling Point/Outfall 015 - Cooling waters (Sonoco BM 12 and Wisconsin Rapids Paper Mill PM 14 vacuum pump seal waters (now idled)), noncontact cooling waters (condensing steam turbine and other sources) and storm water, if present, monitored after mixing, but prior to discharge to the Wisconsin River.
    - This outfall is now covered under Sonoco’s permit, WPDES Permit No. WI-0067318-01-0.
- Sampling Point/Outfall 019 - Cooling waters (Wisconsin Rapids Paper Mill PM 16 vacuum pump seal water and deaerator seal box) and noncontact cooling waters monitored after mixing, but prior to discharge to the Wisconsin River.
    - Sampling point has been removed due to operations at WRPM being idled.
- Sampling Point/Outfall 010 - Noncontact cooling waters (Wisconsin Rapids Fiber and Energy recovery boilers, R-8 chillers, Evaporators 1 and 2, pre-evaporators and other sources) and stormwater, if present, monitored after mixing, but prior to discharge to the Wisconsin River.
    - Sampling point has been removed due to operations at WRFE being idled.
- Sampling Point/Outfall 021 - Noncontact cooling water (Wisconsin Rapids Fiber and Energy steam condenser and, potentially, Evaporators 1 and 2 and the HVLC cooler) sampled prior to mixing with stormwater and discharge to the Wisconsin River via Outfall 021.
    - Sampling point has been removed due to operations at WRFE being idled.

- Sampling Point/Outfall 025 - Biron Mill Sampling Point 025, cooling waters (PM 25 deaerator vacuum pump seal water) and noncontact cooling waters (PM 25 MCC air conditioning and other sources) shall be sampled after mixing, but prior to combining with wastewaters that are monitored at Sampling Point 026 and prior to discharging to the Wisconsin River via Outfall 011.

    - See explanation above under Sampling Point 125 – 128 for an explanation for why these sampling points were removed.

- Sampling Point/Outfall 026 - Biron Mill Sampling Point 026, cooling waters (PM 25 vacuum pump seal water), noncontact cooling waters (boiler house steam turbine condenser, stock preparation area MCC air conditioning and other sources) and roof drainage (boiler house and train shed), if present, shall be monitored after mixing, but prior to combining with wastewaters that are monitored at Sampling Point 025 and prior to discharging to the Wisconsin River via Outfall 011.

    - See explanation above under Sampling Point 125 – 128 for an explanation for why these sampling points were removed.

- Sampling Point/Outfall 027 - Biron Mill Sampling Point 027, cooling waters (PM 26 deaerator and paper machine vacuum pump seal waters) and noncontact cooling waters (PM 26 hydraulic cooling system) shall be sampled after mixing, but prior to combining with wastewaters that are monitored at Sampling Point 028 and prior to discharging to the Wisconsin River via Outfall 018.

    - See explanation above under Sampling Point 125 – 128 for an explanation for why these sampling points were removed.

- Sampling Point/Outfall 028 - Biron Mill Sampling Point 028, noncontact cooling waters (PM 26 chilled water system) shall be sampled after mixing, but prior to combining with wastewaters that are monitored at Sampling Point 027 and prior to discharging to the Wisconsin River via Outfall 018.

    - Sampling Points 025, 026, 027, and 028 have been removed due to all monitoring moved to Outfalls 018 and 011. See explanation above under Sampling Point 125 – 128 for an explanation for why these sampling points were removed.

NOTE: If full operations resume at either the Wisconsin Rapids Mill or Wisconsin Rapids Fiber and Energy, a permit modification will be required to add monitoring and reporting requirements for those additional operations. Due to the uncertainty of the future production rates and classification of industrial operations at these facilities, technology-based effluent limits and water quality-based effluent limitations must be re-calculated to account for these additional discharges. The permittee should allow a minimum of 6 months for the drafting of this future permit modification.

Permit Requirements

1 Influent – Water Intake Structure (WIS) – Monitoring

1.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
601	Sampling Point 601 represents the point upstream of the Biron Mill where mercury is monitored in the Wisconsin River
701	Sampling Point 701 represents the Biron Mill Accelator Intake.
702	Sampling Point 702 represents the Biron Mill Main River Water System Intake.
703	Sampling Point 703 represents the Biron Mill 45# Steam Condenser Intake.
704	Sampling Point 704 represents the Biron Mill Boiler House 24-Inch Intake.
705	Sampling Point 705 represents the Biron Mill Boiler House 48-Inch Intake.
709	Sampling Point 709 represents the Wisconsin Rapids Emergency Fire Intake

1.2 Monitoring Requirements and BTA Determinations

1.2.1 Sampling Point 601 – BM Upstream Monitoring

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Grab	

Changes from Previous Permit

This sampling point was moved from being referenced in the 'surface water' section of the permit to the influent section to align reporting requirements with those of other permits with intake monitoring.

1.2.2 Sampling Point 701 - BM ACCELATOR INTAKE; 702- BM MAIN RIVER WATER INTAKE; 703- BM 45# STEAM CONDENSER INTAKE; 704- BM BOILER HOUSE 24-INCH INTAKE; 705- BM BOILER HOUSE 48-Inch INTAKE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Intake Water Used Exclusively For		% Flow	Annual	Calculated	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Cooling					

Changes from Previous Permit

Flow monitoring and annual cooling water usage calculation is now included.

Explanation of Limits and Monitoring Requirements

Water Intake Structure (WIS)- The Influent section includes the WIS description, authorization for use, and BTA (Best Technology Available) determination. The permittee is authorized to use the cooling water intake structure system. The permittee is required to calculate and report the percentage of water used exclusively for cooling purposes to assess NR 111 applicability. See attached BTA determination (Appendix A) for more information.

1.2.3 Sample Point Number: 709- WRPM EMERGENCY FIRE INTAKE

Changes from Previous Permit:

No changes. This intake is only used for emergencies. Included in this fact sheet and permit for reference despite no reporting required.

2 In-Plant

2.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
113	Sampling Point 113 represents the field blank that accompanies mercury monitoring at the Biron Mill.
114	Sampling Point 114 represents the field blank that accompanies mercury monitoring at the Water Quality Center.

2.2 Monitoring Requirements

2.2.1 Sample Point Number: 113- BM MERCURY FIELD BLANK; 114- WQC MERCURY FIELD BLANK

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Blank	

Changes from Previous Permit:

No changes.

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

3.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
011	Biron Mill Sampling Point 011 represents the combined discharge of PM 25 deaerator vacuum pump seal water and PM 25 vacuum pump seal water prior to discharge to the Wisconsin River via Outfall 011.
018	Biron Mill Sampling point 018 represents the combined discharge of PM 26 deaerator vacuum pump seal water and PM 26 vacuum pump seal water prior to discharge to the Wisconsin River via Outfall 018.
012	At Biron Mill Sampling Point 012, noncontact cooling waters (boiler house condenser, oil heat exchanger and other sources) and roof drainage (kraft pulp receiving and OMC buildings), if present, shall be monitored after mixing, but prior to discharging to the Wisconsin River via Outfall 012.
013	At Biron Mill Sampling Point 013, noncontact cooling waters (groundwood and thermo-mechanical pulping, whitewater and oil heat exchangers, 45# Steam Condenser, and all other sources), Wisconsin River intrusion water and stormwater, if present, shall be monitored after mixing, but prior to discharging to the Wisconsin River via Outfall 013.
001	At Water Quality Center Sampling Point 001, Water Quality Center final effluent shall be sampled prior to discharge to the Wisconsin River via Outfall 001.
003	At Water Quality Center Sampling Point 003, groundwater from beneath the liner of the Water Quality Center's Aeration Basin 3 shall be monitored prior to discharge via Outfall 003 to a ditch that flows to Cranberry Creek (WQC).
005	At Water Quality Center Sampling Point 005 (816), groundwater from beneath the liners of Areas 3, 4 and 5 of the Water Quality Center's landfill shall be monitored prior to discharge via Outfall 005 to a mitigated wetland near 5th Avenue.
006	At Water Quality Center Sampling Point 006 (822), groundwater from beneath the liners of Areas 6 and 7 of the Water Quality Center's landfill shall be monitored prior to discharge via Outfall 006 to a ditch that flows to Cranberry Creek (WQC). PLACEHOLDER: DEPARTMENT APPROVAL REQUIRED PRIOR TO INITIAL USE.
007	Water Quality Center Sampling Point 007 represents uncontaminated runoff from Areas 6 and 7 of the Water Quality Center's landfill prior to discharge from the sedimentation basin to a ditch that flows to Cranberry Creek (WQC). NO MONITORING REQUIRED.

3.2 Monitoring and Limitations

3.2.1 Sampling Point (Outfall) 011 – PM 025 VPSW + DVPSW COMBINED

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Calculated	
Copper, Total Recoverable		μg/L	Monthly	Flow Prop Comp	
Temperature Maximum	Weekly Avg	61 deg F	Daily	Continuous	Limit effective April beginning 2031
Temperature Maximum	Weekly Avg	69 deg F	Daily	Continuous	Limit effective May beginning 2030
Temperature Maximum	Weekly Avg	79 deg F	Daily	Continuous	Limit effective June beginning 2030
Temperature Maximum	Weekly Avg	88 deg F	Daily	Continuous	Limit effective July and August beginning 2030
Temperature Maximum	Weekly Avg	77 deg F	Daily	Continuous	Limit effective September beginning 2030
Temperature Maximum	Weekly Avg	75 deg F	Daily	Continuous	Limit effective October beginning 2030
Acute WET		TU_a	See Listed Qtr(s)	Flow Prop Comp	
Chronic WET	Monthly Avg	3.3 TUc	See Listed Qtr(s)	Flow Prop Comp	

Changes from Previous Permit

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

- Total Residual Chlorine limits and monitoring now removed.
- Temperature required to be reported as a maximum instead of an average.
- Variable weekly average temperature limits now included.
- Temperature 'Sample Type' changed from 'Grab' to 'Continuous'.
- Temperature and flow rate reporting frequency changed from 'Weekly' to 'Daily'.
- Limit of 3.3 TUc now included for Chronic WET testing.
- Copper sample type changed from 'Grab' to 'Flow Prop Comp'.

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 10/07/2024 (Appendix D).

Total Residual Chlorine monitoring and limits were removed, as this permittee no longer utilizes chlorine for this wastewater outfall. For reference, the permittee collected zero chlorine samples during the previous permit term.

Temperature is required to be reported as a maximum instead of an average pursuant to s. NR 106.54(1), Wis. Adm. Code. Temperature reporting is now continuous because the permittee has installed a temperature monitoring probe at this outfall. This is also why daily flow reporting is required as that data is already collected and required to be reported, pursuant to s. NR 205.07(1)(r)2., Wis. Adm. Code.

Copper sampling is now described as a flow proportional composite sample. While the description of this form of sample collection has changed, the actual method the permittee uses has not, as it's still a combination of two grab samples.

3.2.2 Sampling Point (Outfall) 018 – PM 26 VPSW + DVPSW COMBINED

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Calculated	
Copper, Total Recoverable		μg/L	Monthly	Flow Prop Comp	
Temperature Maximum	Daily Max	120 deg F	Daily	Continuous	Limit effective year-round
Temperature Maximum	Weekly Avg	66 deg F	Daily	Continuous	Limit effective March beginning 2031
Temperature Maximum	Weekly Avg	61 deg F	Daily	Continuous	Limit effective April beginning 2031
Temperature Maximum	Weekly Avg	69 deg F	Daily	Continuous	Limit effective May and November beginning 2030
Temperature Maximum	Weekly Avg	79 deg F	Daily	Continuous	Limit effective June beginning 2030
Temperature Maximum	Weekly Avg	88 deg F	Daily	Continuous	Limit effective July and August beginning 2030
Temperature Maximum	Weekly Avg	77 deg F	Daily	Continuous	Limit effective September beginning 2030
Temperature Maximum	Weekly Avg	75 deg F	Daily	Continuous	Limit effective October beginning 2030
Acute WET		TU_a	See Listed Qtr(s)	Flow Prop Comp	
Chronic WET		TUc	See Listed Qtr(s)	Flow Prop Comp	

Changes from Previous Permit

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

- Total Residual Chlorine limits and monitoring now removed.
- Temperature required to be reported as a maximum instead of an average.
- Variable weekly average temperature limits now included.
- Temperature 'Sample Type' changed from 'Grab' to 'Continuous'.
- Copper sample type changed from 'Grab' to 'Flow Prop Comp'

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 10/07/2024.

Total Residual Chlorine monitoring and limits were removed, as this permittee no longer utilizes chlorine for this wastewater outfall. For reference, the permittee collected zero chlorine samples during the previous permit term.

Temperature is required to be reported as a maximum instead of an average pursuant to s. NR 106.54(1), Wis. Adm. Code. Temperature reporting is now continuous because the permittee has installed a temperature monitoring probe at this outfall. This is also why daily flow reporting is required as that data is already collected and required to be reported, pursuant to s. NR 205.07(1)(r)2., Wis. Adm. Code.

Copper sampling is now described as a flow proportional composite sample. While the description of this form of sample collection has changed, the actual method the permittee uses has not, as it's still a combination of two grab samples.

3.2.3 Sampling Point (Outfall) 012 - BM NCCW (boiler house)

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Chlorine, Total Residual	Daily Max	38 µg/L	Monthly	Grab	
Chlorine, Total Residual	Weekly Avg	17 µg/L	Monthly	Grab	
Chlorine, Total Residual	Monthly Avg	17 µg/L	Monthly	Grab	
Temperature Maximum	Daily Max	120 deg F	Daily	Continuous	
Temperature Maximum	Weekly Avg	66 deg F	Daily	Continuous	Limit effective March beginning 2031
Temperature Maximum	Weekly Avg	61 deg F	Daily	Continuous	Limit effective April beginning 2031
Temperature Maximum	Weekly Avg	69 deg F	Daily	Continuous	Limit effective May beginning 2030

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Temperature Maximum	Weekly Avg	79 deg F	Daily	Continuous	Limit effective June beginning 2030
Temperature Maximum	Weekly Avg	88 deg F	Daily	Continuous	Limit effective July and August beginning 2030
Temperature Maximum	Weekly Avg	77 deg F	Daily	Continuous	Limit effective September beginning 2030
Temperature Maximum	Weekly Avg	75 deg F	Daily	Continuous	Limit effective October beginning 2030

Changes from Previous Permit

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

- 'Sample Frequency' and 'Sample Type' for Flow Rate has been changed from 'Weekly' to 'Daily' and from 'Estimated' to 'Continuous'
- 'Sample Frequency' and 'Sample Type' for Temperature has been changed from 'Weekly' to 'Daily' and from 'Grab' to 'Continuous'
- Monthly and weekly average limits included for Total Residual Chlorine.
- Variable weekly average temperature limits now included, effective 04/01/2030.
- Temperature required to be reported as a maximum instead of an average.

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 10/07/2024 (Appendix D).

Temperature and Flow Rate reporting has been increased from 'Weekly' to 'Daily' to align the frequency of data collection with the frequency of reporting, pursuant to s. NR 205.07(1)(r)2., Wis. Adm. Code.

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

Temperature is required to be reported as a maximum instead of an average pursuant to s. NR 106.54(1), Wis. Adm. Code.

3.2.4 Sampling Point (Outfall) 013 - BM NCCW (pulping)

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

Monitoring Requirements and Effluent Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chlorine, Total Residual	Daily Max	38 μg/L	Monthly	Grab	
Chlorine, Total Residual	Weekly Avg	17 μg/L	Monthly	Grab	
Chlorine, Total Residual	Monthly Avg	17 μg/L	Monthly	Grab	
Temperature Maximum	Daily Max	120 deg F	Daily	Continuous	
Temperature Maximum	Weekly Avg	62 deg F	Daily	Continuous	Limit effective February beginning 2031
Temperature Maximum	Weekly Avg	66 deg F	Daily	Continuous	Limit effective March beginning 2031
Temperature Maximum	Weekly Avg	61 deg F	Daily	Continuous	Limit effective April beginning 2031
Temperature Maximum	Weekly Avg	69 deg F	Daily	Continuous	Limit effective May beginning 2030
Temperature Maximum	Weekly Avg	79 deg F	Daily	Continuous	Limit effective June beginning 2030
Temperature Maximum	Weekly Avg	88 deg F	Daily	Continuous	Limit effective July and August beginning 2030
Temperature Maximum	Weekly Avg	77 deg F	Daily	Continuous	Limit effective September beginning 2030
Temperature Maximum	Weekly Avg	75 deg F	Daily	Continuous	Limit effective October beginning 2030

Changes from Previous Permit

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

- ‘Sample Frequency’ and ‘Sample Type’ for Flow Rate has been changed from ‘Weekly’ to ‘Daily’ and from ‘Estimated’ to ‘Continuous’
- ‘Sample Frequency’ and ‘Sample Type’ for Temperature has been changed from ‘Weekly’ to ‘Daily’ and from ‘Grab’ to ‘Continuous’
- Monthly and weekly average limits included for Total Residual Chlorine.
- Temperature required to be reported as a maximum instead of an average.
- Variable weekly average temperature limits now included, effective 04/01/2030.

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 10/07/2024 (Appendix D).

Temperature and Flow Rate reporting has been increased from 'Weekly' to 'Daily' to align the frequency of data collection with the frequency of reporting, pursuant to s. NR 205.07(1)(r)2., Wis. Adm. Code.

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

Temperature is required to be reported as a maximum instead of an average pursuant to s. NR 106.54(1), Wis. Adm. Code.

3.2.5 Sample Point Number: 001- WQC EFFLUENT

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	Monitoring/reporting daily May through October
BOD5, Total		mg/L	5/Week	24-Hr Flow Prop Comp	Monitoring/reporting 5x/week November through April
BOD5, Total	Daily Max	19,522 lbs/day	Daily	Calculated	Monitoring/reporting daily May through October
BOD5, Total	Monthly Avg	10,032 lbs/day	Daily	Calculated	Monitoring/reporting daily May through October
BOD5, Total	Daily Max	19,522 lbs/day	5/Week	Calculated	Monitoring/reporting 5x/week November through April
BOD5, Total	Monthly Avg	10,032 lbs/day	5/Week	Calculated	Monitoring/reporting 5x/week November through April
Suspended Solids, Total		mg/L	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Daily Max	27,194 lbs/day	5/Week	Calculated	
Suspended Solids, Total	Monthly Avg	13,829 lbs/day	5/Week	Calculated	
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	Weekly	24-Hr Flow Prop Comp	
Phosphorus, Total	Monthly Avg	185 lbs/day	Weekly	Calculated	
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					the DMR.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-month rolling sum of total monthly mass of phosphorus discharged and report on the last day of the month on the DMR
Temperature Maximum	Daily Max	105 deg F	Daily	Continuous	Limit effective year-round
Temperature Maximum	Weekly Avg	86 deg F	Daily	Continuous	Limit effective May 2030
Temperature Maximum	Weekly Avg	96 deg F	Daily	Continuous	Limit effective June 2030
Temperature Maximum	Weekly Avg	100 deg F	Daily	Continuous	Limit effective July 2030
Mercury, Total Recoverable		ng/L	Monthly	Grab	
PFOS		ng/L	Monthly	Grab	
PFOA		ng/L	Monthly	Grab	
WLA BOD_5 Value		lbs/day	Daily	Calculated	Monitoring/reporting daily May through October
WLA BOD_5 Adjusted Value		lbs/day	Daily	Calculated	Monitoring/reporting daily May through October
WLA BOD_5 Discharged	Daily Max - Variable	lbs/day	Daily	Calculated	Monitoring/reporting daily May through October
WLA Previous Day River Flow		cfs	Daily	Continuous	Monitoring/reporting daily May through October
WLA Previous Day River Temp		deg F	Daily	Continuous	Monitoring/reporting daily May through October
WLA 5 Day Sum of BOD5 Discharged	Daily Max - Variable	lbs	Daily	Calculated	Monitoring/reporting daily May through October
WLA 5 Day Sum of WLA Values		lbs	Daily	Calculated	Monitoring/reporting daily May through October
Acute WET		TUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
pH (Continuous)			Daily	Continuous	See "Continuous pH Monitoring" for pH limits and allowed excursions

Changes from Previous Permit

Effluent limitations and monitoring requirements were evaluated for this permit term and the following changes were made from the previous permit. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below. When determining 'Changes', monitoring requirements at the combined outfalls (e.g., 022) are also considered since those outfalls were removed.

- Monitoring for AOX has been removed
- Monitoring for all 17 Dioxin/Furan congeners has been removed.
- Total Phosphorus mass limit of 185 lbs/day is now included, along with reporting monthly and annual mass loadings.
- Daily reporting of maximum temperature is now required.
- Weekly average temperature limits are effective after 04/01/2030.
- Mercury limit of 38 ng/L has been removed.

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 10/07/2024.

Temperature

Temperature is required to be reported as a maximum instead of an average pursuant to s. NR 106.54(1), Wis. Adm. Code.

AOX and Dioxin/Furans

Monitoring for AOX and the 17 Dioxin/Furan congeners were originally placed in the permit because of the technology-based effluent limits that were triggered from the bleaching activities at WRFE. Because this plant is idled and no longer contributes wastewaters to the WQC, and subsequent monitoring shows these pollutants are not present at levels which would cause or contribute to an exceedance of a water quality standard or secondary value calculation, monitoring has been removed. If the WQC receives wastewater in the future which may contain AOX or Dioxins/Furans, the permit must be modified to incorporate those sampling requirements.

Phosphorus

Wisconsin River Total Maximum Daily Load (TMDL): The permitted facility is included within the Wisconsin River Basin Total Maximum Daily Load (TMDL), which was approved by EPA April 26, 2019. The TMDL establishes Waste Load Allocations (WLAs) for point source dischargers and determines the maximum amounts of phosphorus that can be discharged and still protect water quality. The final effluent limits and monitoring expressed in the permit were derived from Site-Specific Criteria (SSC) for Lakes Petenwell, Castle Rock, and Wisconsin originally included in Appendix K of the TMDL report and approved by the U.S. Environmental Protection Agency on July 9, 2020. The permittee's approved SSC-based limits are consistent with the assumptions and requirements of the EPA-approved WLA in the TMDL, which is 32,220 lbs/yr for the permitted facility.

The approved TMDL expresses WLAs as lbs/year and lbs/day (maximum annual load divided by 365 days). As outlined in Section 4.6 of the department's TMDL Development and Implementation Guidance: Integrating the WPDES and Impaired Waters Program, mass limits must be given in the permit that are consistent with the TMDL WLA and the phosphorus impracticability agreement that was approved by USEPA in 2012. Continuously discharging facilities covered by the WRB TMDL are given monthly average mass limits. If the equivalent effluent concentration is less than or equal to 0.3 mg/L, six-month average mass limits (averaging period of May through October and November through April) are also included. The equivalent effluent concentration of 0.35 mg/L was calculated for the facility, thus, the TMDL based mass limit is expressed as a monthly average.

Facilities with WRB TMDL based effluent limits for phosphorus must report the 12-month rolling sum of total monthly discharge (lbs/yr). If reported 12-month rolling sums exceed the facility's max annual WLA, the facility's mass limits (monthly average and six-month average) may be recalculated using more appropriate CVs or monitoring frequencies when the permit is reissued to bring discharge levels into compliance with the facility's given WLA.

PFOS and PFOA

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 industrial dischargers to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(d), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration industry type and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that the industrial discharger category may be a potential source of PFOS/PFOA.

3.2.6 Sample Point Number: 003- WQC AERATION BASIN 3 GW

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.8 mg/L	Monthly	Grab	Limit effective June through September
Copper, Total Recoverable		ug/L	Quarterly	Grab	
PFOS		ng/L	Monthly	Grab	
PFOA		ng/L	Monthly	Grab	
Acute WET		TUa	See Listed Qtr(s)	Grab	
Chronic WET		TUc	See Listed Qtr(s)	Grab	

Changes from Previous Permit

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

- Monitoring frequency for Flow Rate and Ammonia increased from 1/6 months to Monthly.
- Monthly average ammonia limit is now included.

- Quarterly monitoring for Copper now included.
- Monthly monitoring for PFOA and PFOS now included.
- Acute and Chronic WET testing now required 2x in the next permit term.

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 10/07/2024.

Monitoring frequency for ammonia was increased to monthly to allow for sufficient data collection and ensure compliance with the applicable monthly average ammonia limit.

PFOS and PFOA

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 industrial dischargers to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(d), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration industry type and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that the groundwater may be a potential source of PFOS/PFOA.

3.2.7 Sample Point Number: 005- WQC LF GW (areas 3, 4 and 5)

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.8 mg/L	Monthly	Grab	Limit effective June through September
Copper, Total Recoverable		ug/L	Quarterly	Grab	
Zinc, Total Recoverable	Daily Max	93 ug/L	Quarterly	Grab	
Zinc, Total Recoverable	Weekly Avg	93 ug/L	Quarterly	Grab	
Zinc, Total Recoverable	Daily Max	0.21 lbs/day	Quarterly	Calculated	
Zinc, Total Recoverable	Weekly Avg	0.17 lbs/day	Quarterly	Calculated	
Hardness, Total as CaCO3		mg/L	Quarterly	Grab	
PFOS		ng/L	Monthly	Grab	
PFOA		ng/L	Monthly	Grab	
Acute WET		TUa	See Listed Qtr(s)	Grab	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Chronic WET		TUc	See Listed Qtr(s)	Grab	

Changes from Previous Permit

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

- Monthly ammonia, PFOS, and PFOA monitoring is now required.
- A monthly average ammonia limit of 1.8 mg/L, effective June through September, is now included.
- Quarterly copper, zinc, and hardness monitoring is now required.
- Daily maximum and weekly average concentration and mass limits for zinc are now included.
- 2x per permit term Acute and annual Chronic WET testing is now required.

Explanation of Limits and Monitoring Requirements

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 10/07/2024.

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. Based on this guidance, monitoring frequencies were set at monthly for ammonia and quarterly for copper and zinc.

Toxicity of metals is directly tied to the hardness of the water. Because of this, quarterly monitoring for hardness is included to pair with the copper and zinc sample results.

PFOS and PFOA

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 industrial dischargers to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(d), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration industry type and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that the groundwater may be a potential source of PFOS/PFOA.

3.2.8 Sample Point Number: 006- PH: WQC LF GW (areas 6 and 7)

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Monthly	Estimated	PLACEHOLDER OUTFALL:

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					MONITORING FOR ALL PARAMETERS NOT REQUIRED UNTIL ACTIVATION. DEPARTMENT APPROVAL TO ACTIVATE REQUIRED PRIOR TO COMMENCING DISCHARGE.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.8 mg/L	Monthly	Grab	Limit effective June through September
Copper, Total Recoverable		ug/L	Quarterly	Grab	
PFOS		ng/L	Monthly	Grab	
PFOA		ng/L	Monthly	Grab	
Acute WET		TUa	See Listed Qtr(s)	Grab	
Chronic WET		TUc	See Listed Qtr(s)	Grab	

Changes from Previous Permit

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

- Monthly ammonia, PFOS, and PFOA monitoring is now required.
- A monthly average ammonia limit of 1.8 mg/L, effective June through September, is now included.
- Quarterly copper monitoring is now required.
- 2x per permit term Acute and annual Chronic WET testing is now required.

Explanation of Limits and Monitoring Requirements

It's important to note that monitoring at this outfall is only required when the 6 and 7 sections of the landfill are open. Clarification of the notification of the activation of this outfall has been included in the proposed permit.

Detailed discussions of limits and monitoring requirements can be found in the attached water quality-based effluent limits (WQBEL) memo dated 10/07/2024.

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. Based on this guidance, monitoring frequencies were set at monthly for ammonia and quarterly for copper and zinc.

Toxicity of metals is directly tied to the hardness of the water. Because of this, quarterly monitoring for hardness is included to pair with the copper and zinc sample results.

PFOS and PFOA

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 industrial dischargers to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(d), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration industry type and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that the groundwater may be a potential source of PFOS/PFOA.

3.2.9 Sample Point Number: 007- WQC LF SED BASIN

Changes from Previous Permit

None. This outfall is for informational purposes and no monitoring is required in the reissued permit.

4 Land Application

4.1 Sampling Point(s)

Sampling Point Designation	
Sampling Point Number	**Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)**
099	At Water Quality Center Sampling Point 099, wastewater treatment system sludge from the Water Quality Center shall be sampled prior to land application via Outfall 099.

4.2 Monitoring and Limitations

4.2.1 Sample Point Number: 099- WQC SLUDGE

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Quarterly	Grab Comp	
Nitrogen, Total Kjeldahl		Percent	Quarterly	Grab Comp	
Nitrogen, Ammonia (NH3-N) Total		Percent	Quarterly	Grab Comp	
Phosphorus, Total		Percent	Annual	Grab Comp	
Phosphorus, Water Extractable		% of Tot P	Annual	Grab Comp	
Potassium, Total Recoverable		Percent	Annual	Grab Comp	
pH Field		su	Annual	Grab	
Chloride		Percent	Annual	Grab Comp	
Fluoride		mg/kg	Once	Grab Comp	Sample once in 2027.
Aluminum Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.
Barium, Total Recoverable		mg/kg	Once	Grab Comp	Sample once in 2027.
Boron Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.
Cadmium Dry Wt		mg/kg	Annual	Grab Comp	
Calcium Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.
Copper Dry Wt		mg/kg	Annual	Grab Comp	
Iron Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.
Lead Dry Wt		mg/kg	Annual	Grab Comp	
Magnesium Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.
Manganese Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Molybdenum Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.
Nickel Dry Wt		mg/kg	Annual	Grab Comp	
Sodium Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.
Strontium, Total Recoverable		mg/kg	Once	Grab Comp	Sample once in 2027.
Zinc Dry Wt		mg/kg	Annual	Grab Comp	
Dioxin, 2,3,7,8-TCDD TE		ng/kg	Annual	Calculated	
Dioxin, 2,3,7,8-TCDD Dry Wt		ng/kg	Annual	Grab Comp	
Furan, 2,3,7,8-TCDF Dry Wt		ng/kg	Annual	Grab Comp	
PCB Total Dry Wt		mg/kg	Once	Grab Comp	Sample once in 2027.
PFOA + PFOS		ug/kg	Annual	Calculated	
Priority Pollutant Scan			Once	Grab Comp	As specified in ch. NR 215.03 (1-6), Wis. Adm. Code (excluding asbestos). Use grab samples for mercury, cyanide and VOCs.
PFAS Dry Wt			Annual	Grab Comp	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Permit Sections for more information.
Dioxins & Furans (all congeners)			Once	Grab Comp	As specified in ch. NR 106.115, Wis. Adm. Code.

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. See additional explanation of limits under "Explanation of Limits and Monitoring Requirements" below.

- **Nitrogen, Nitrite + Nitrate Total** – Monitoring has been removed.
- **Chloride** – Monitoring has been increased from 'Once' to 'Annual'
- **Water Extractable Phosphorus (WEP)** – Monitoring is required annually.
- **PFAS** – Monitoring is required annually.

Explanation of Limits and Monitoring Requirements

Requirements for land application of industrial sludge are determined in accordance with ch. NR 214 Wis. Adm. Code.

Nitrogen and Solids Monitoring

Chapter NR 214, Wis. Adm. Code, limits the maximum application rate of nitrogen to that required by the crop or cover vegetation that is grown on the application site. Consequently, the proposed permit requires monitoring for those forms of nitrogen that are necessary to assess plant-available nitrogen; i.e., organic nitrogen, ammonia nitrogen, and nitrate nitrogen.

Since crop nitrogen requirements usually establish the maximum application rate for sludge, relatively frequent monitoring for total Kjeldahl nitrogen (TKN) and ammonia nitrogen is warranted. Therefore, the proposed permit retains the monitoring frequency for TKN and ammonia nitrogen at quarterly. To calculate the amount of nitrogen that is available to plants after sludge application, it is necessary to determine the amount of organic nitrogen in the sludge.

Since organic nitrogen is determined by subtracting the ammonia nitrogen concentration from the TKN concentration, it is appropriate to sample for TKN and ammonia at the same time. Previous monitoring of Nitrate + Nitrite revealed it to comprise <0.005%, confirming that it is not a significant source. Thus, monitoring has been removed.

The proposed permit requires all sludge parameters, with the exception of pH, to be reported on a dry weight basis. To do so, the Water Quality Center must determine the solids content of its sludge each time that testing for a sludge parameter is performed. Therefore, the proposed monitoring frequency for total solids remains quarterly, which is the same frequency as that of the most frequently monitored sludge parameters.

Metals

Chapter NR 214 limits the application rate of cadmium and restricts cumulative loadings of cadmium, copper, lead, nickel, and zinc. Since the metals content of the Water Quality Center's sludge is quite low, metal loading limits do not restrict the rate of sludge application from year to year. Nevertheless, occasional monitoring is appropriate to track total loadings of the metals. Therefore, the proposed permit retains the monitoring frequency for cadmium, copper, lead, nickel and zinc at once per year.

Table 4
Maximum Cumulative Cadmium, Copper, Lead, Nickel and Zinc Application for a Landspreading Site

	Soil Cation Exchange Capacity (meq/100g)			
	Less than 5 lbs/ac	5–10 lbs/ac	10–15 lbs/ac	Greater than 15 lbs/ac
Lead	445	890	1,335	1,750
Zinc	225	445	670	890
Copper	110	220	335	445
Nickel	45	90	135	180
Cadmium				
Soil pH < 6.5	4.5	4.5	4.5	4.5
Soil pH ≥ 6.5	4.5	9.0	13.5	18

Chloride
Chloride monitoring has been increased from 'Once' per permit term to 'Annual' to track chloride loading rates which are land applied on agricultural fields. Ch. NR 214, Wis. Adm. Code includes chloride loading limits associated with land applied liquid industrial waste. While this is an industrial sludge and not a liquid waste, the data is still important to gather to track loadings year over year.

PFAS
The presence and fate of PFAS in municipal and industrial sludges is an emerging public health concern. EPA has developed a draft risk assessment that the department is reviewing at the time of this permit reissuance. 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), Wis. Adm. Code.

Total PCBs
Pursuant to ch. NR 219, Wis. Adm. Code, PCB monitoring in sludge requires the use of EPA Method 1668 or 8082A with all extraction and clean-up steps necessary to provide detection limits equal to or less than 0.11 mg/kg (110 ug/kg) for the Aroclors or 0.003 mg/kg (3 µg/kg) for specific PCB congeners. The proposed permit defines total PCBs as the sum of all detected Aroclors or congeners, depending on which test method is used. If none are detected, total PCBs should be reported as less than the highest (greatest) limit of detection reported for any of the Aroclors or congeners. Since PCBs are priority pollutants, monitoring for PCBs is not a new permit requirement.

All Remaining Parameters
To be exempt from regulation under Wisconsin Administrative Code ch. NR 518, Landspreading of Solid Waste, sludge must be analyzed for nutrients, salts, pH, metals, and the priority pollutants (s. NR 518.02 (1)). The proposed permit requires monitoring for ch. NR 518 parameters to allow, at a minimum, a periodic reevaluation of the exemption.

Sludge monitoring performed to date reveals ch. NR 518 parameters warrant no further monitoring beyond a single test during the permit's term, with the exceptions discussed above for nitrogen, solids, pH, those metals listed in ch. NR 214, and dioxins and furans.. To permit a reevaluation of sludge characteristics as part of the permit reissuance process in 2030, the proposed permit requires testing in 2027 for all parameters with a sample frequency of once.

5 Schedules

5.1 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan: Submit a management plan to optimize the land application system performance and demonstrate compliance with Wisconsin Administrative Code NR 214.	10/31/2025

5.2 Total Dioxin Equivalents Loadings Report

By February 28th of each year, the permittee shall report the cumulative loading of total dioxin equivalents for each site that received sludge during the previous calendar year.

Required Action	Due Date
Annual Total Dioxin Equivalents Loading Report: The permittee shall report the cumulative loading of total dioxin equivalents for each site that received sludge during 2025. If no land application occurred, then this report is not required.	02/28/2026
Annual Total Dioxin Equivalents Loading Report: The permittee shall report the cumulative loading of total dioxin equivalents for each site that received sludge during 2026. If no land application occurred, then this report is not required.	02/28/2027
Annual Total Dioxin Equivalents Loading Report: The permittee shall report the cumulative loading of total dioxin equivalents for each site that received sludge during 2027. If no land application occurred, then this report is not required.	02/28/2028
Annual Total Dioxin Equivalents Loading Report: The permittee shall report the cumulative loading of total dioxin equivalents for each site that received sludge during 2028. If no land application occurred, then this report is not required.	02/28/2029
Annual Total Dioxin Equivalents Loading Report: The permittee shall report the cumulative loading of total dioxin equivalents for each site that received sludge during 2029. If no land application occurred, then this report is not required.	02/28/2030
Ongoing Annual Total Dioxin Equivalents Loading Reports: In the event that this permit is not reissued by the expiration date and is administratively continued, the permittee shall report the cumulative loading of total dioxin equivalents for each site that received sludge during the previous year by February 28th of the following year. If no land application occurred, then this report is not required.	

5.3 Cooling Water Intake Structures - General

Required Action	Due Date
Annual Certification Statement: The permittee shall submit an Annual Certification on the intake structure, as required by s. 1.3.3.1 of this WPDES permit.	01/31/2026
Annual Certification Statement: The permittee shall submit an Annual Certification on the intake structure, as required by s. 1.3.3.1 of this WPDES permit.	01/31/2027
Annual Certification Statement: The permittee shall submit an Annual Certification on the intake structure, as required by s. 1.3.3.1 of this WPDES permit.	01/31/2028
Annual Certification Statement: The permittee shall submit an Annual Certification on the intake structure, as required by s. 1.3.3.1 of this WPDES permit.	01/31/2029

CWIS Application Materials Due: Unless an exemption has been authorized, the permittee shall submit the application materials required in s. NR 111.40(2)(c), Wis. Adm. Code by the Due Date.	12/01/2029
Annual Certification Statement: The permittee shall submit an Annual Certification on the intake structure, as required by s. 1.3.3.1 of this WPDES permit.	01/31/2030
Ongoing Annual Certification Statements: In the event this permit is not reissued by the expiration date and is administratively continued, the permittee shall continue to submit annual certification statements by January 31st of each year.	

5.4 Cooling Water Intake Structures - Upgrades (Intakes 701, 702, 703, 704, and 705)

Required Action	Due Date
Report on Intake Structure: Submit a report on the location, design, operation and capacity of the existing intake structure.	07/31/2026
Action Plan: Submit a plan describing actions needed to achieve BTA (Best Technology Available) requirements.	07/31/2027
Status Update: The permittee shall submit a report documenting the status of compliance with federal and state BTA requirements.	07/31/2028
Complete Actions: Complete actions necessary to achieve compliance with the BTA requirements.	07/31/2029

5.5 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
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. 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.	07/31/2026
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. 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. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. 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. 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	07/31/2027

action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	

5.6 Ammonia Limits Compliance (Outfalls 003, 005, and 006)

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Preliminary Compliance Report: Submit a preliminary compliance report indicating alternatives to achieving the final ammonia limits.	07/31/2026
Action Plan: Submit an action plan on how compliance will be achieved for the ammonia effluent limit by the Due Date.	07/31/2027
Initiate Actions: The permittee shall initiate actions necessary to achieve compliance with the 1.8 mg/L ammonia limits by the Due Date	01/31/2028
Complete Actions: The permittee shall complete actions necessary to come into compliance with the 1.8 mg/L monthly average ammonia limits for Outfalls 003, 005, and 006.	07/31/2028

5.7 Temperature Limits Compliance (Outfalls 001, 011, 012, 013 and 018)

This compliance schedule requires the permittee to achieve compliance by the specified date.

Required Action	Due Date
Preliminary Compliance Report: Submit a preliminary compliance report indicating alternatives to achieve the final temperature limits. Informational Note: Refer to NR 106 Subchapters V & VI or NR 102.26, Wis. Adm. Code, for information regarding the re-evaluation of limits.	07/31/2026
Action Plan: Submit an action plan for complying with all applicable effluent temperature limits.	07/31/2027
Construction Plans: Submit construction plans (if construction is required for complying with effluent temperature limits) and include plans and specifications with the submittal. If construction is not required for complying with effluent temperature limits, provide an update on the progress which is being made towards compliance.	07/31/2028
Initiate Actions: Initiate actions identified in the plan.	07/31/2029
Complete Actions: Complete actions necessary to achieve compliance with effluent temperature limits.	07/31/2030

5.8 Permit Application Submittal

The permittee shall file an application for permit reissuance in accordance with NR 200, Wis. Adm. Code.

Required Action	Due Date
Permit Application Submittal: Submit a complete permit application to the Department no later than 180 days prior to permit expiration.	12/01/2029

Explanation of Schedules

Land Application Management Plan

An up-to-date Land Application Management plan is a standard requirement in reissued industrial permits per s. NR 214.17(6)(c), Wis. Adm. Code.

Total Dioxin Loading Report
This report is required to track dioxin loadings over time in accordance with s. 4.6.3 of this WPDES permit.

Cooling Water Intake Structure - General
Annual certification statements are required to be submitted annually to ensure proper operation and maintenance of the intake structures.

Industrial Intake Structure Evaluation/Upgrades
Per the BTA determination (See Appendix B-1), the permittee is required to upgrade the existing intake structures to comply with one of the impingement mortality standards in ch. NR 111, Wis. Adm. Code. For this reissuance, the department has concluded that all structures are BTA for entrainment mortality.

PFOS/PFOA Minimization Plan Determination of Need
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.

Ammonia Limits
A three-year compliance schedule is provided to allow the permittee time to comply with the applicable ammonia limits for the groundwater outfalls (003, 005, and 006). These limits will go into effect on August 1, 2028. The length of this compliance schedule to allow for the collection of more data and give the permittee time to determine why ammonia is present in this groundwater at these concentrations.

Temperature Limits
A compliance schedule is provided for the next permit term to allow the permittee time to comply with the applicable weekly average temperature limits at Outfalls 001, 011, 012, 013, and 018. These limits will go into effect on August 1, 2030. Part of the reasoning for the extended compliance schedule is that previously the permittee has been reporting temperature as an average, so determination as to whether they can comply with weekly average temperature limits (based on the maximum daily temperatures) is unknown at the time of reissuance.

Permit Application Submittal
This schedule item is included as a reminder to submit the permit application to ensure continued permit coverage.

Permit Expiration Date:

07/31/2030

Attachments

Appendix A – eDMR Data, 2015 – 2024
Appendix B-1 – BTA Determination for Biron Mill Intake Structures
Appendix B-2 – BTA Determination for Wisconsin Rapids Mill Intake Structures
Appendix C – TBEL Calculations
Appendix D – WQBEL Memo

Prepared By:

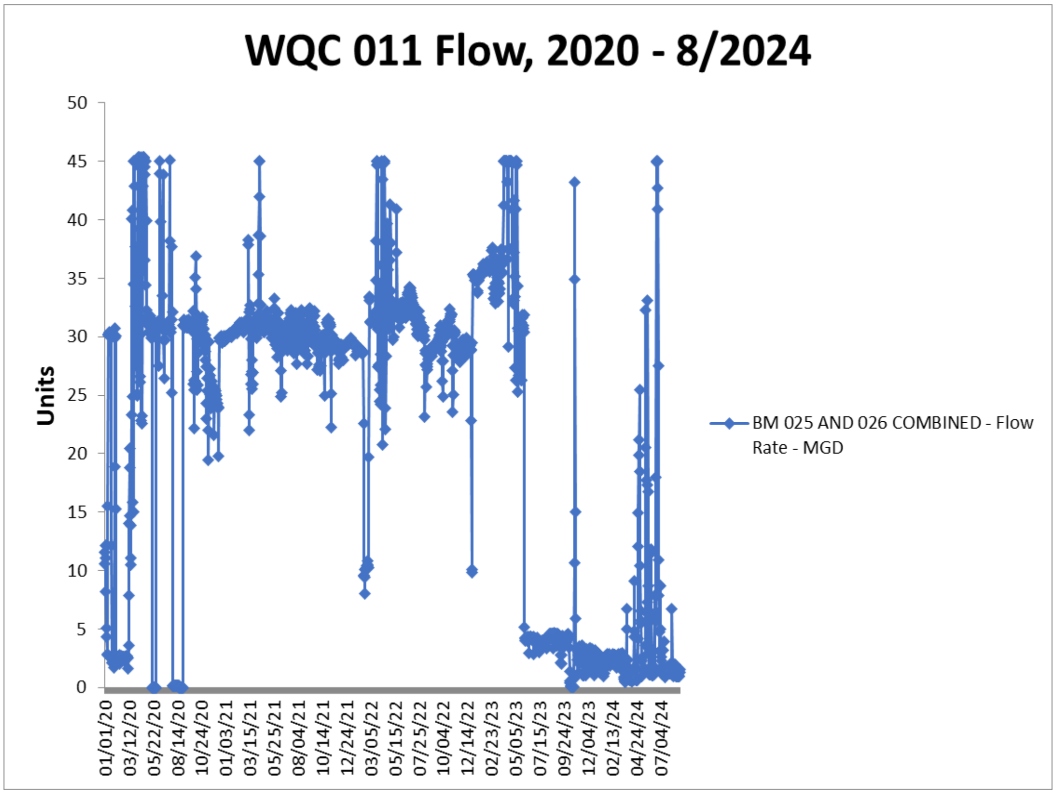
Nate Willis, P.E.
Wastewater Engineer
Bureau of Water Quality

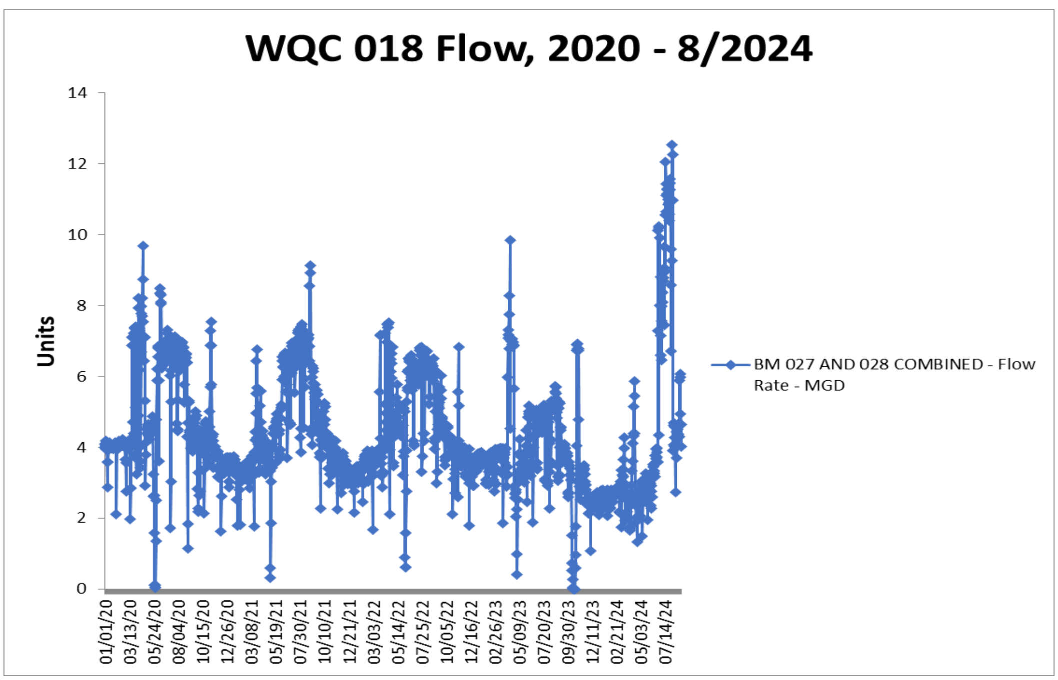
Date: 05/30/2025

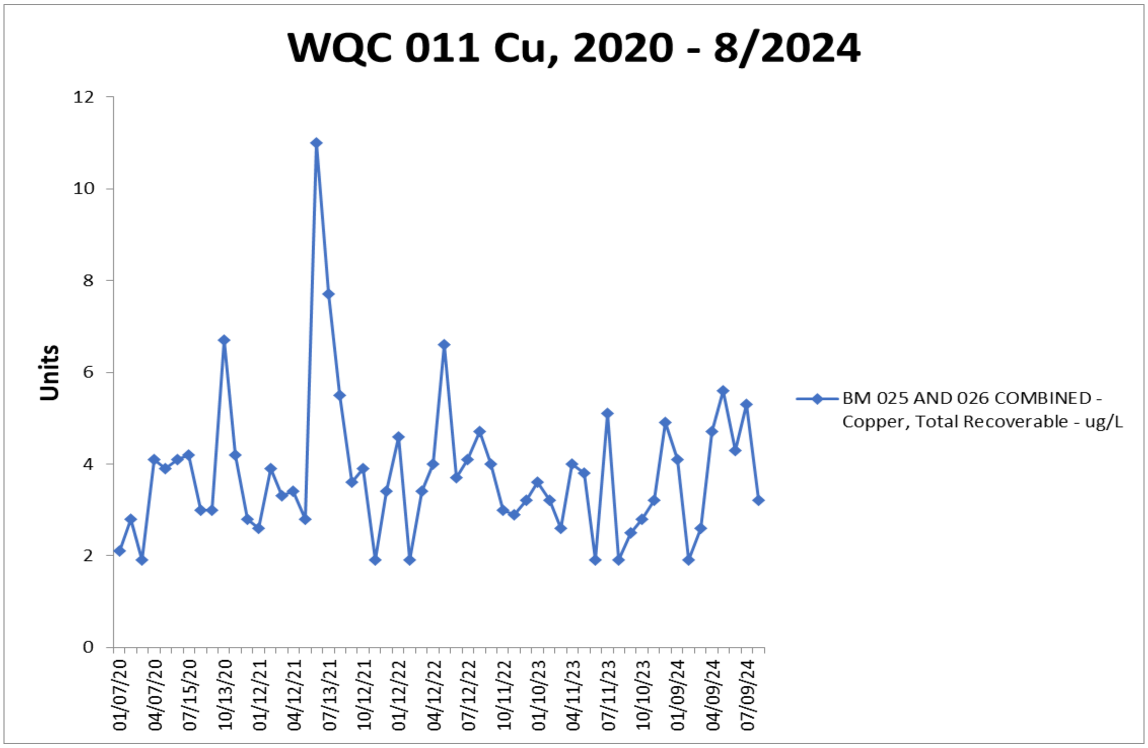
APPENDIX A

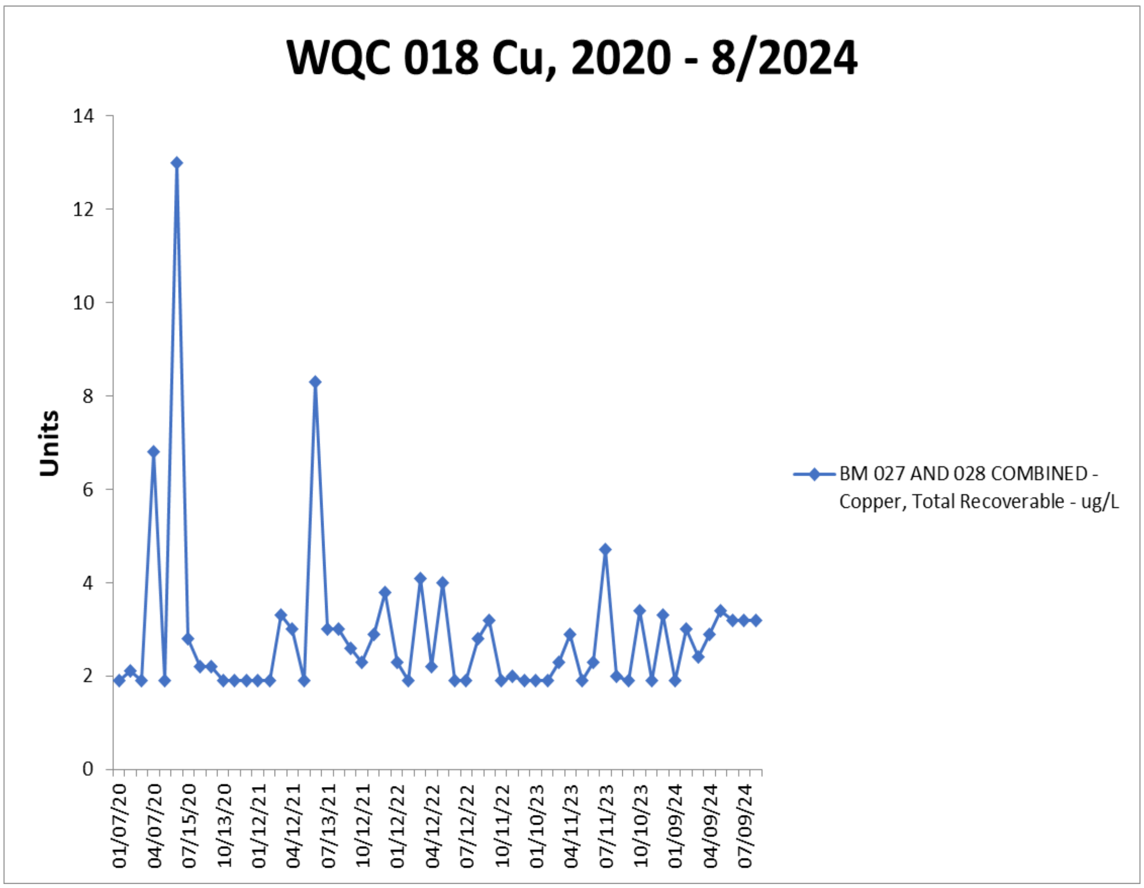
eDMR Data, 2020 – 2024

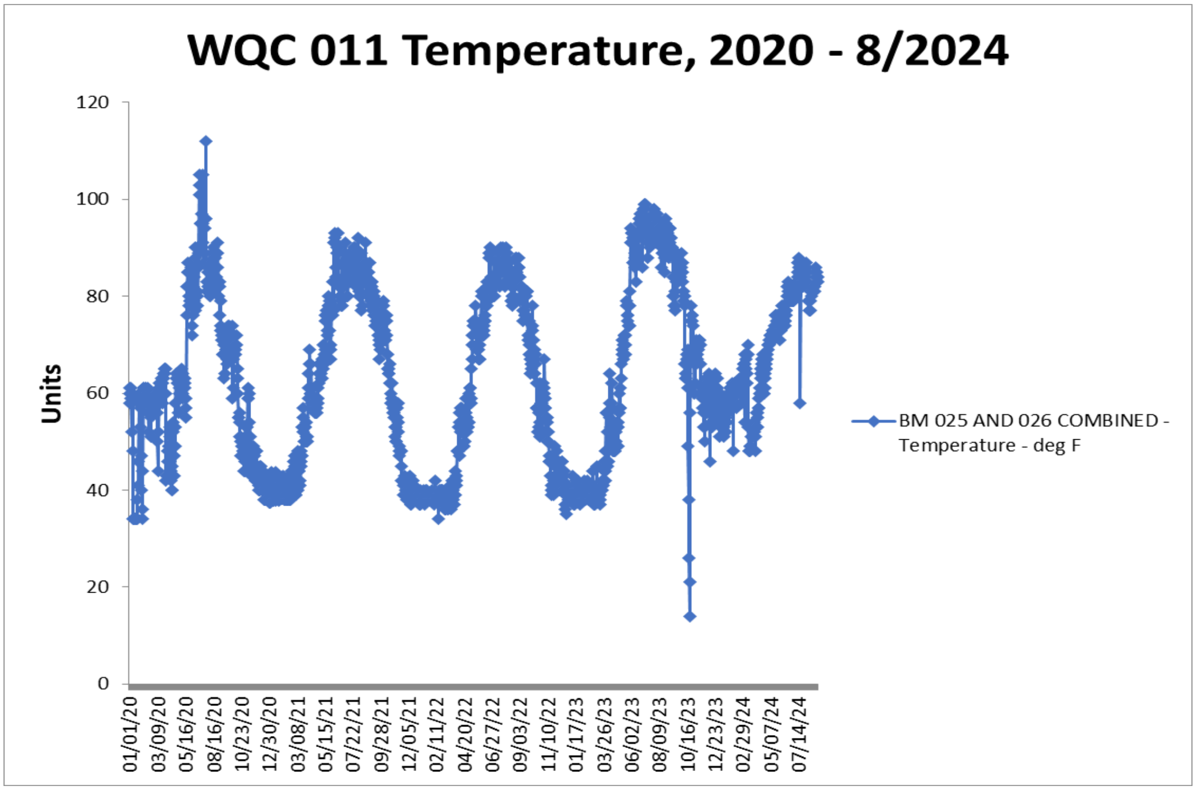
011/018:

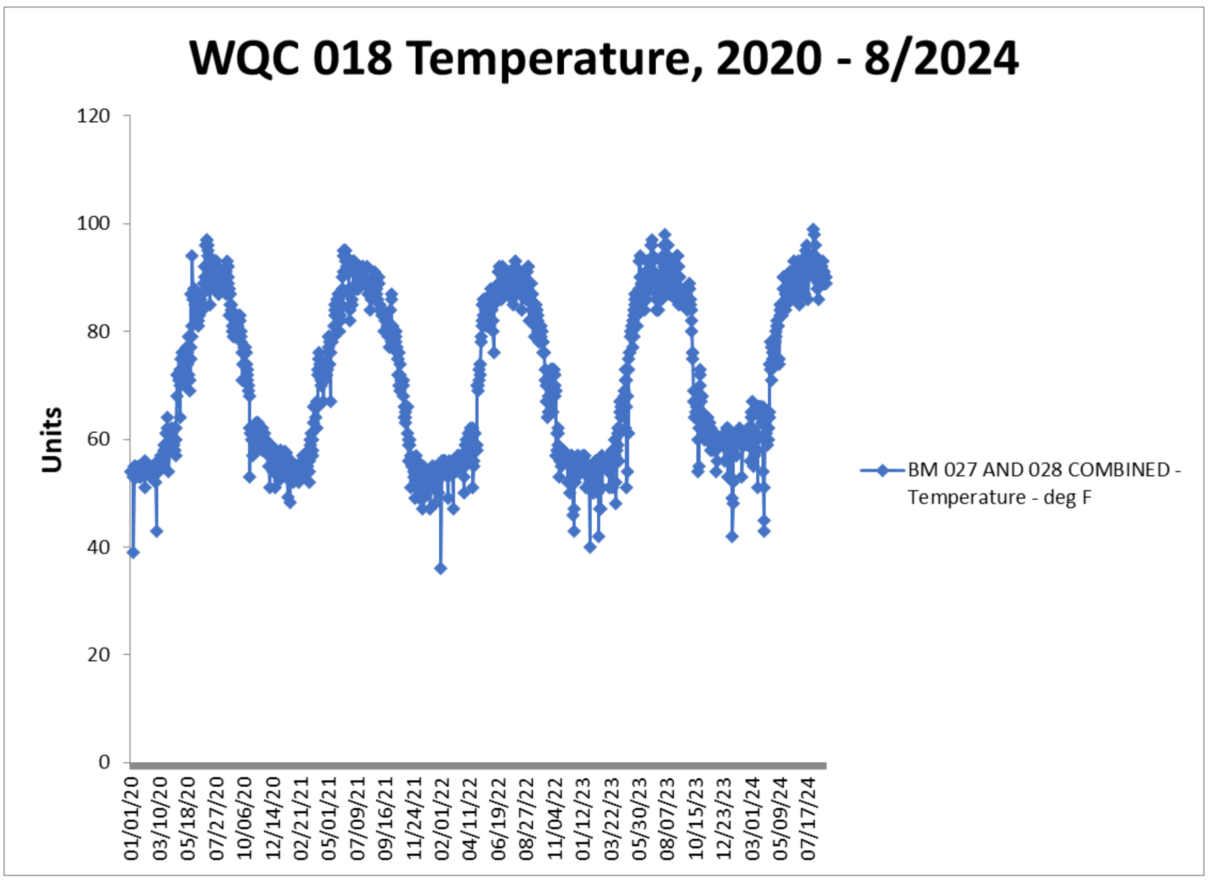




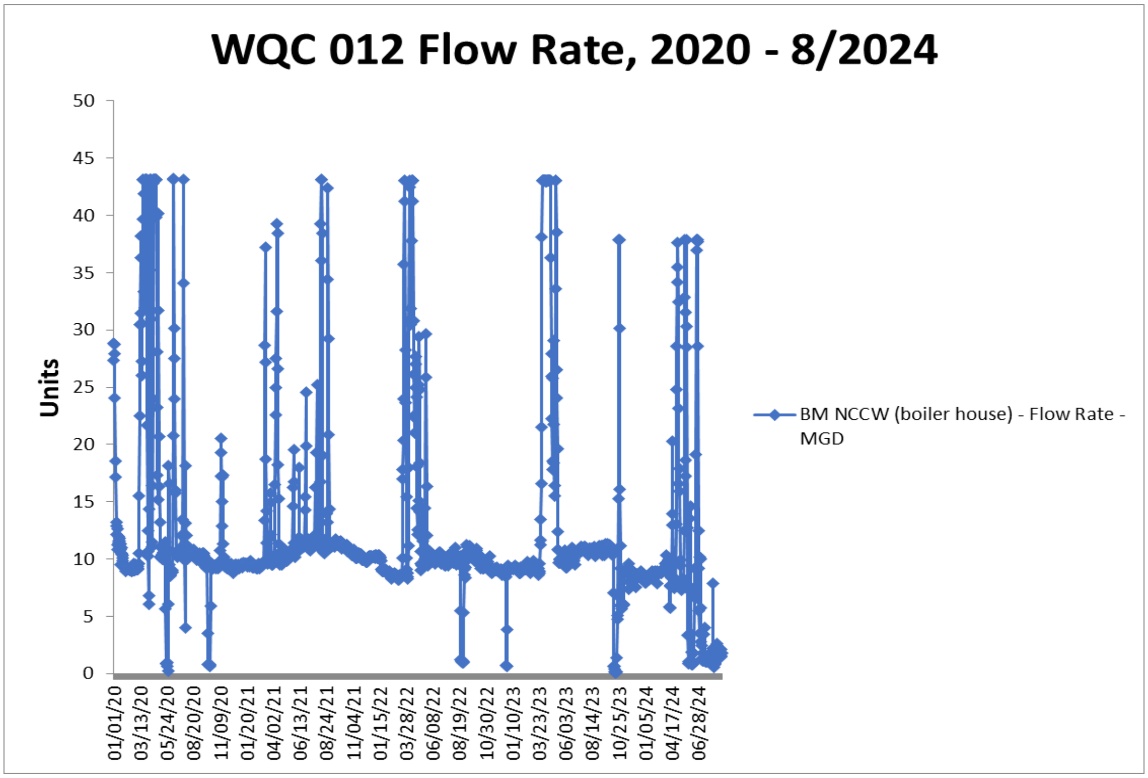

WQC 011 Cu, 2020 - 8/2024
Units
12
10
8
6
4
2
0
01/07/20
04/07/20
07/15/20
10/13/20
01/12/21
04/12/21
07/13/21
10/12/21
01/12/22
04/12/22
07/12/22
10/11/22
01/10/23
04/11/23
07/11/23
10/10/23
01/09/24
04/09/24
07/09/24
BM 025 AND 026 COMBINED - Copper, Total Recoverable - ug/L

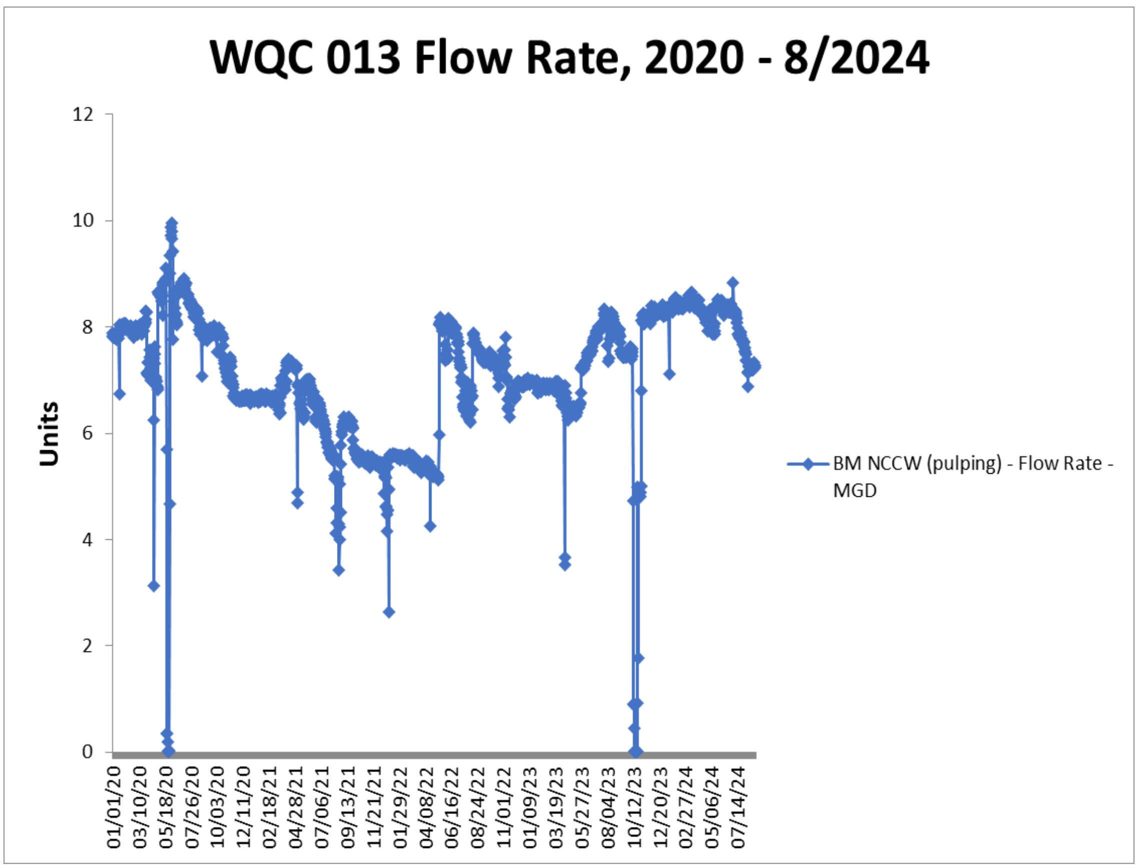

WQC 018 Cu, 2020 - 8/2024
Units
14
12
10
8
6
4
2
0
01/07/20
04/07/20
07/15/20
10/13/20
01/12/21
04/12/21
07/13/21
10/12/21
01/12/22
04/12/22
07/12/22
10/11/22
01/10/23
04/11/23
07/11/23
10/10/23
01/09/24
04/09/24
07/09/24
BM 027 AND 028 COMBINED - Copper, Total Recoverable - ug/L


WQC 011 Temperature, 2020 - 8/2024
120
100
80
60
40
20
0
Units
01/01/20
03/09/20
05/16/20
08/16/20
10/23/20
12/30/20
03/08/21
05/15/21
07/22/21
09/28/21
12/05/21
02/11/22
04/20/22
06/27/22
09/03/22
11/10/22
01/17/23
03/26/23
06/02/23
08/09/23
10/16/23
12/23/23
02/29/24
05/07/24
07/14/24
BM 025 AND 026 COMBINED - Temperature - deg F


WQC 018 Temperature, 2020 - 8/2024
120
100
80
60
40
20
0
Units
01/01/20
03/10/20
05/18/20
07/27/20
10/06/20
12/14/20
02/21/21
05/01/21
07/09/21
09/16/21
11/24/21
02/01/22
04/11/22
06/19/22
08/27/22
11/04/22
01/12/23
03/22/23
05/30/23
08/07/23
10/15/23
12/23/23
03/01/24
05/09/24
07/17/24
BM 027 AND 028 COMBINED - Temperature - deg F

012/13:


WQC 012 Flow Rate, 2020 - 8/2024
Units
50
45
40
35
30
25
20
15
10
5
0
01/01/20
03/13/20
05/24/20
08/20/20
11/09/20
01/20/21
04/02/21
06/13/21
08/24/21
11/04/21
01/15/22
03/28/22
06/08/22
08/19/22
10/30/22
01/10/23
03/23/23
06/03/23
08/14/23
10/25/23
01/05/24
04/17/24
06/28/24
BM NCCW (boiler house) - Flow Rate - MGD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Units
12
10
8
6
4
2
0
01/01/20
03/10/20
05/18/20
07/26/20
10/03/20
12/11/20
02/18/21
04/28/21
07/06/21
09/13/21
11/21/21
01/29/22
04/08/22
06/16/22
08/24/22
11/01/22
01/09/23
03/19/23
05/27/23
08/04/23
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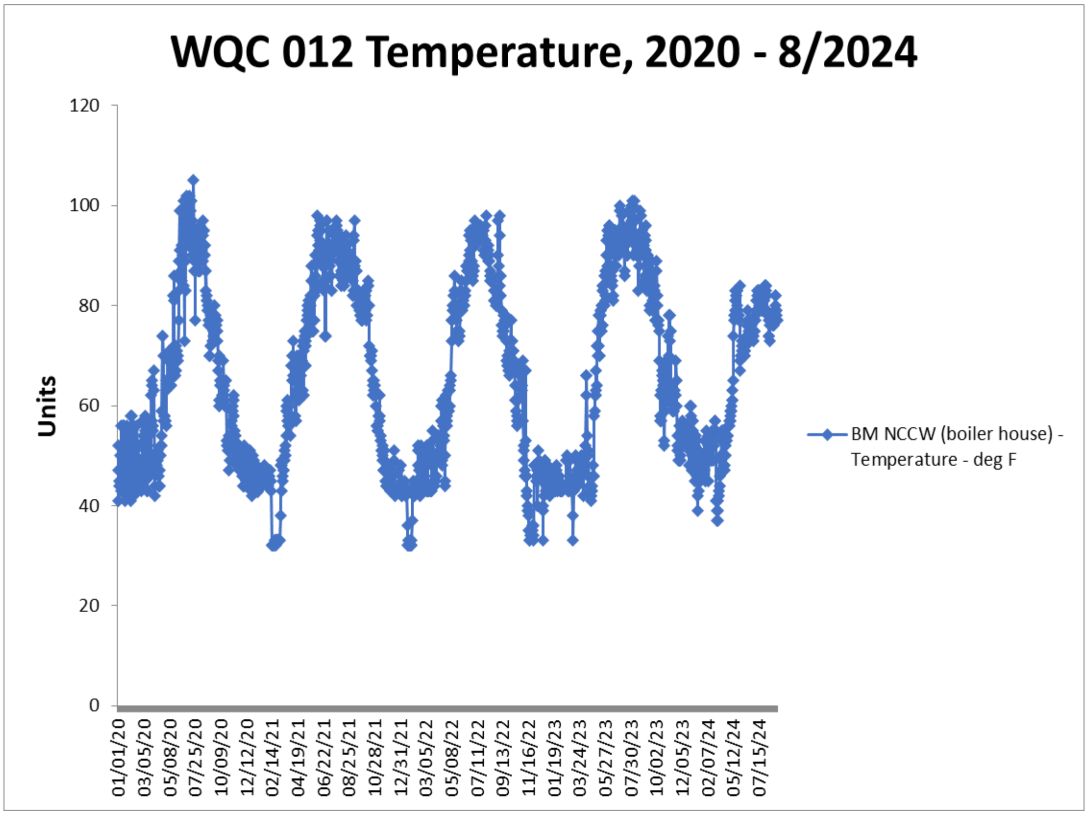
02/27/24
05/06/24
07/14/24
BM NCCW (pulping) - Flow Rate - MGD


WQC 012 Temperature, 2020 - 8/2024
Units
120
100
80
60
40
20
0
01/01/20
03/05/20
05/08/20
07/25/20
10/09/20
12/12/20
02/14/21
04/19/21
06/22/21
08/25/21
10/28/21
12/31/21
03/05/22
05/08/22
07/11/22
09/13/22
11/16/22
01/19/23
03/24/23
05/27/23
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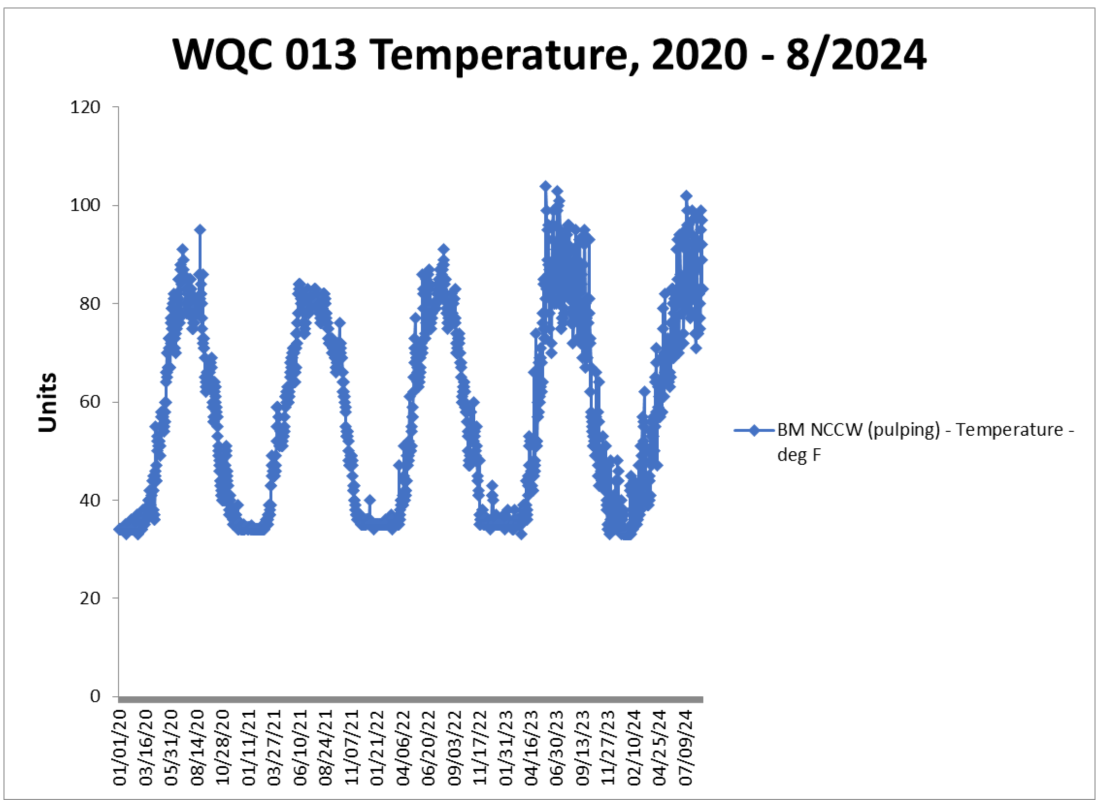
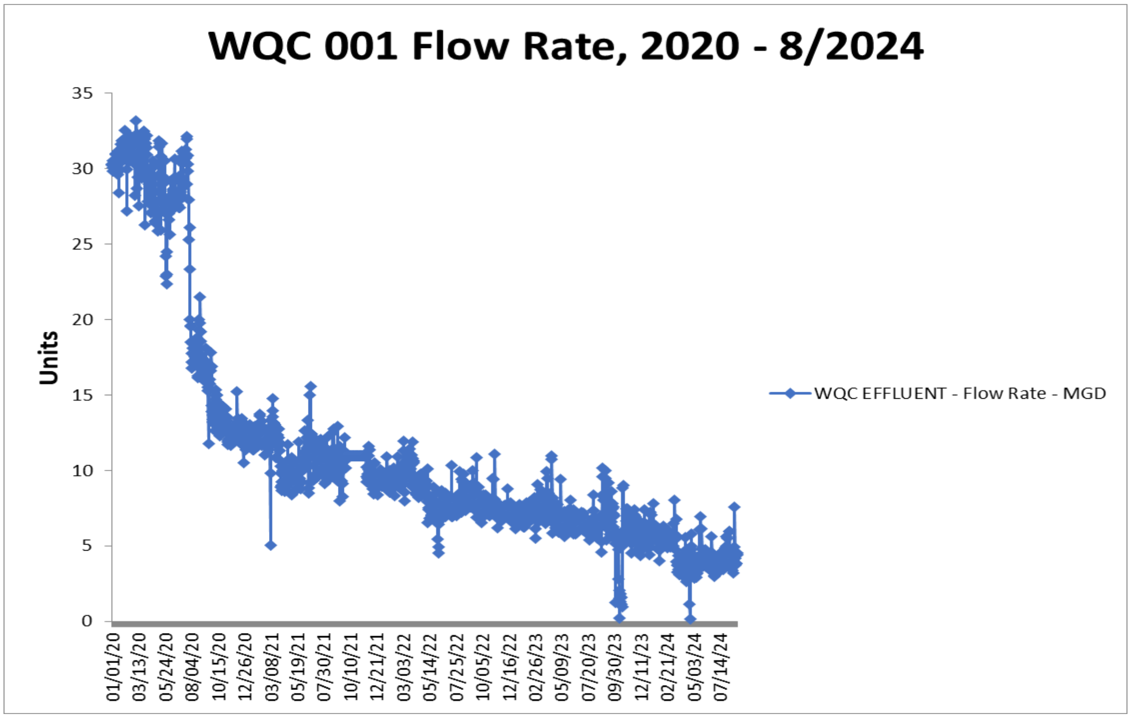
07/15/24
BM NCCW (boiler house) - Temperature - deg F


WQC 013 Temperature, 2020 - 8/2024
Units
120
100
80
60
40
20
0
01/01/20
03/16/20
05/31/20
08/14/20
10/28/20
01/11/21
03/27/21
06/10/21
08/24/21
11/07/21
01/21/22
04/06/22
06/20/22
09/03/22
11/17/22
01/31/23
04/16/23
06/30/23
09/13/23
11/27/23
02/10/24
04/25/24
07/09/24
BM NCCW (pulping) - Temperature - deg F

001:


WQC 001 Flow Rate, 2020 - 8/2024
35
30
25
20
15
10
5
0
Units
WQC EFFLUENT - Flow Rate - MGD
01/01/20
03/13/20
05/24/20
08/04/20
10/15/20
12/26/20
03/08/21
05/19/21
07/30/21
10/10/21
12/21/21
03/03/22
05/14/22
07/25/22
10/05/22
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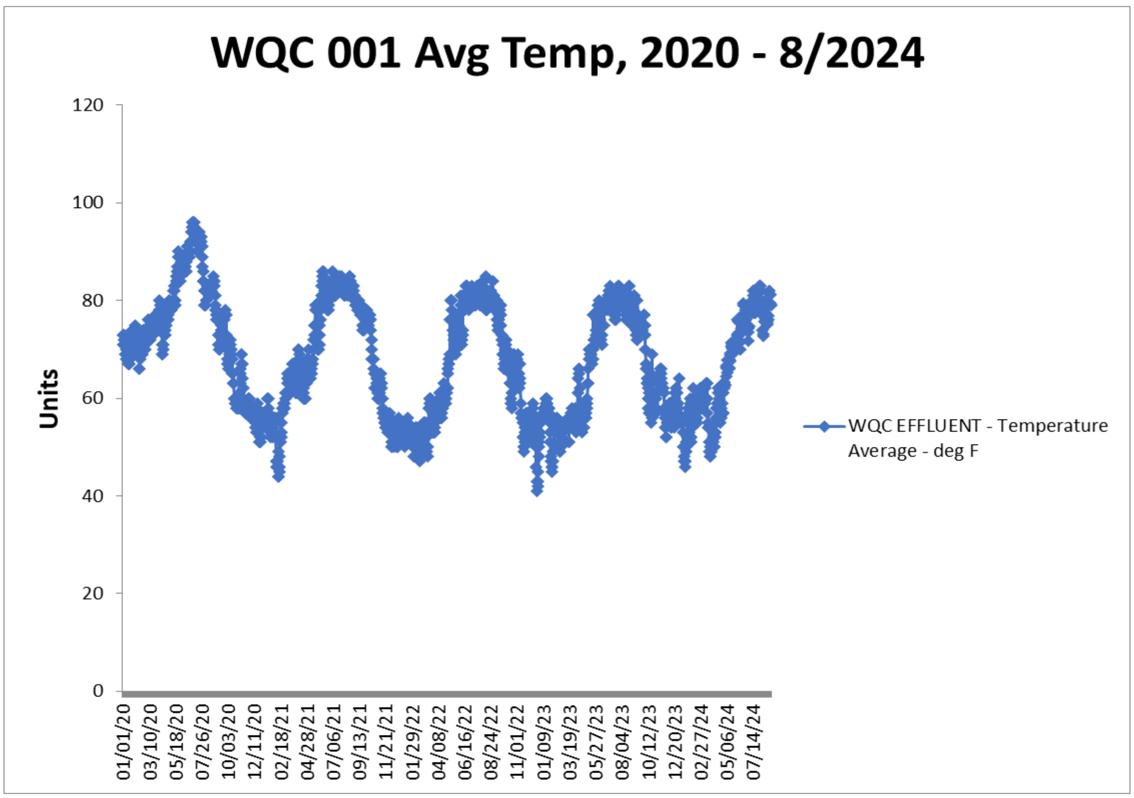
05/03/24
07/14/24


WQC 001 Avg Temp, 2020 - 8/2024
120
100
80
60
40
20
0
Units
WQC EFFLUENT - Temperature Average - deg F
01/01/20
03/10/20
05/18/20
07/26/20
10/03/20
12/11/20
02/18/21
04/28/21
07/06/21
09/13/21
11/21/21
01/29/22
04/08/22
06/16/22
08/24/22
11/01/22
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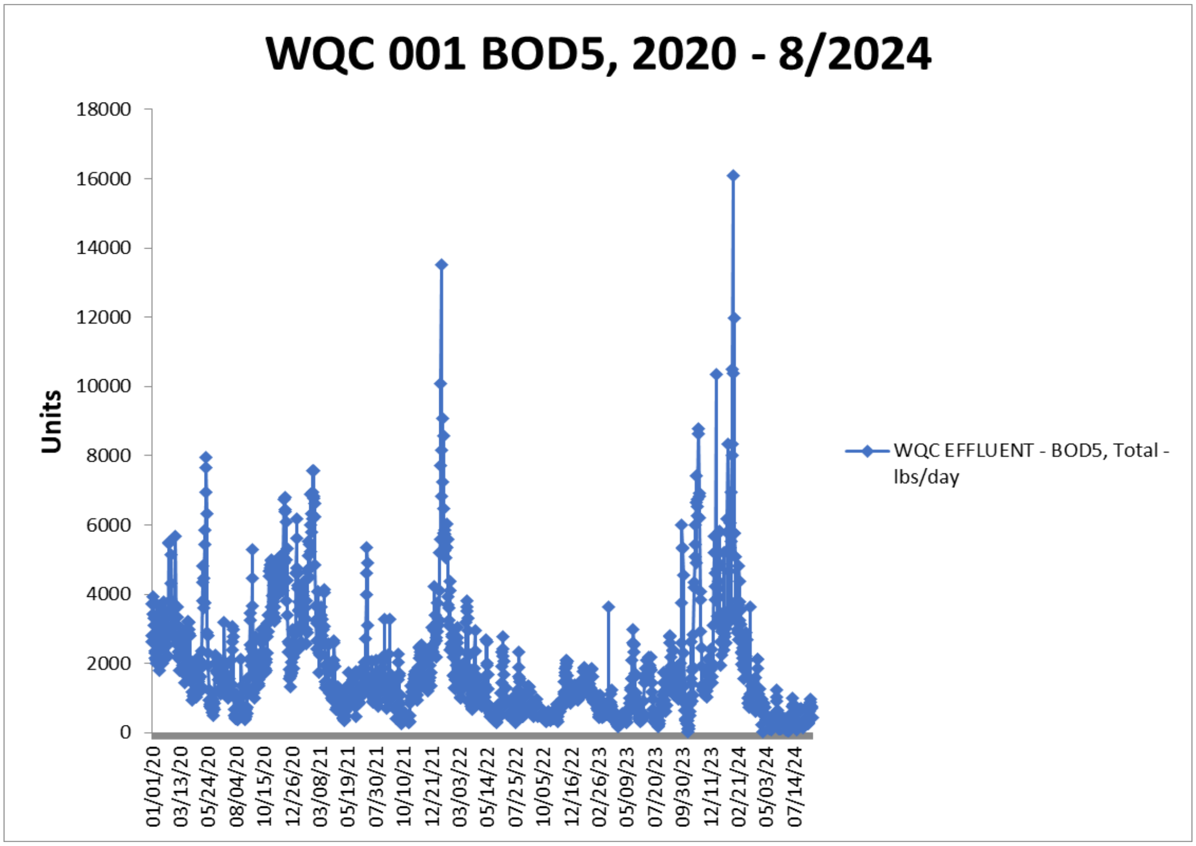
05/06/24
07/14/24


WQC 001 BOD5, 2020 - 8/2024
Units
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
01/01/20
03/13/20
05/24/20
08/04/20
10/15/20
12/26/20
03/08/21
05/19/21
07/30/21
10/10/21
12/21/21
03/03/22
05/14/22
07/25/22
10/05/22
12/16/22
02/26/23
05/09/23
07/20/23
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05/03/24
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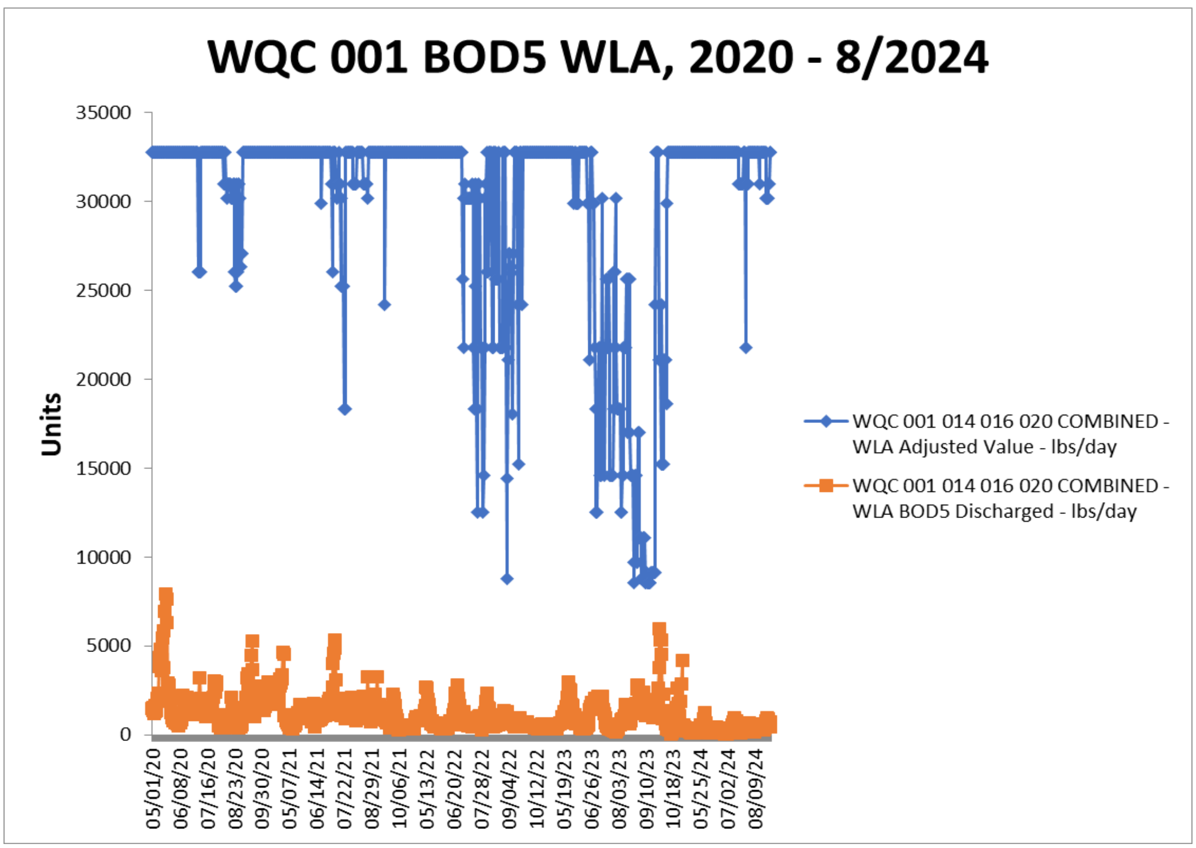
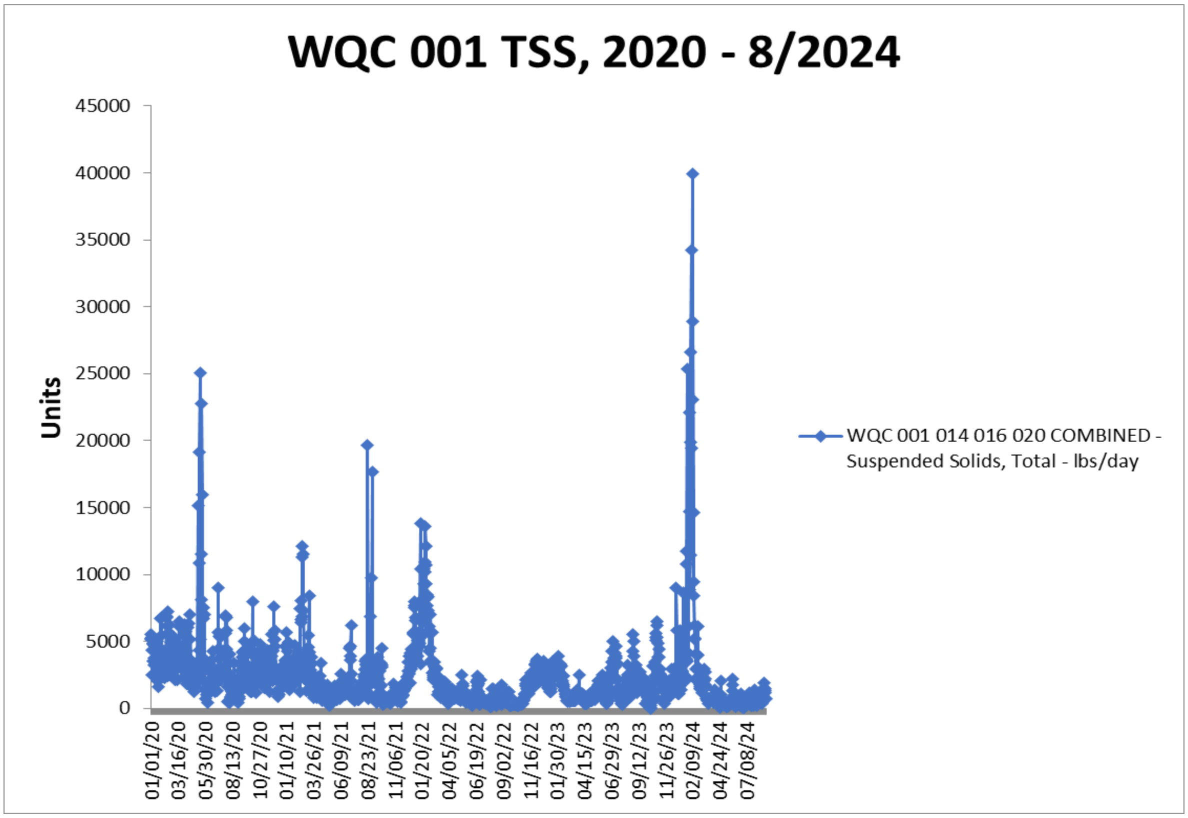
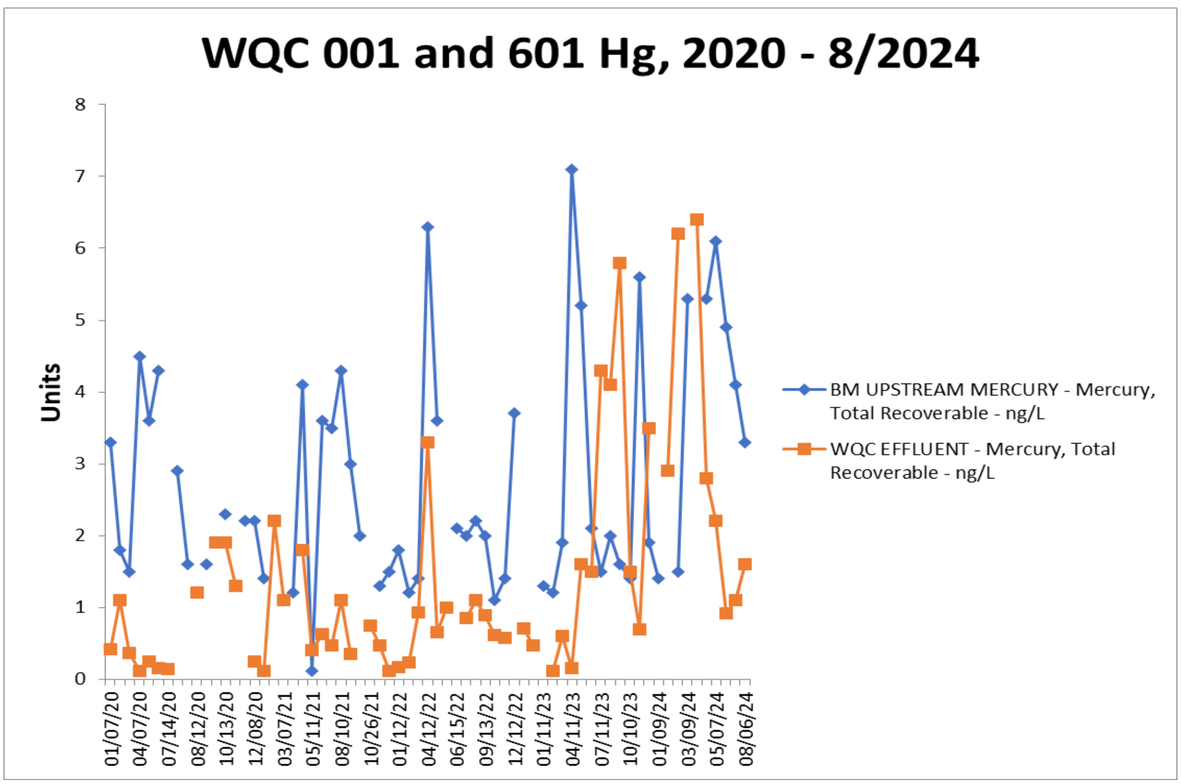
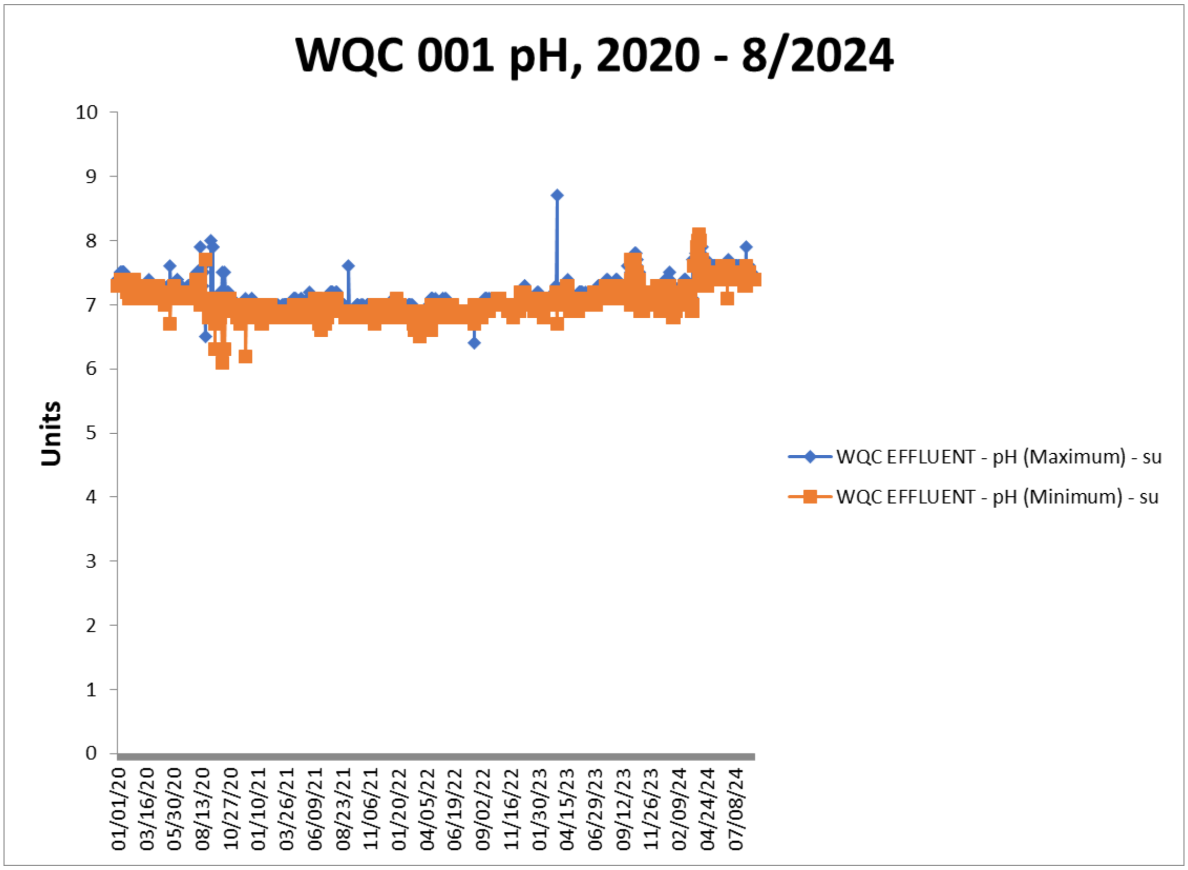
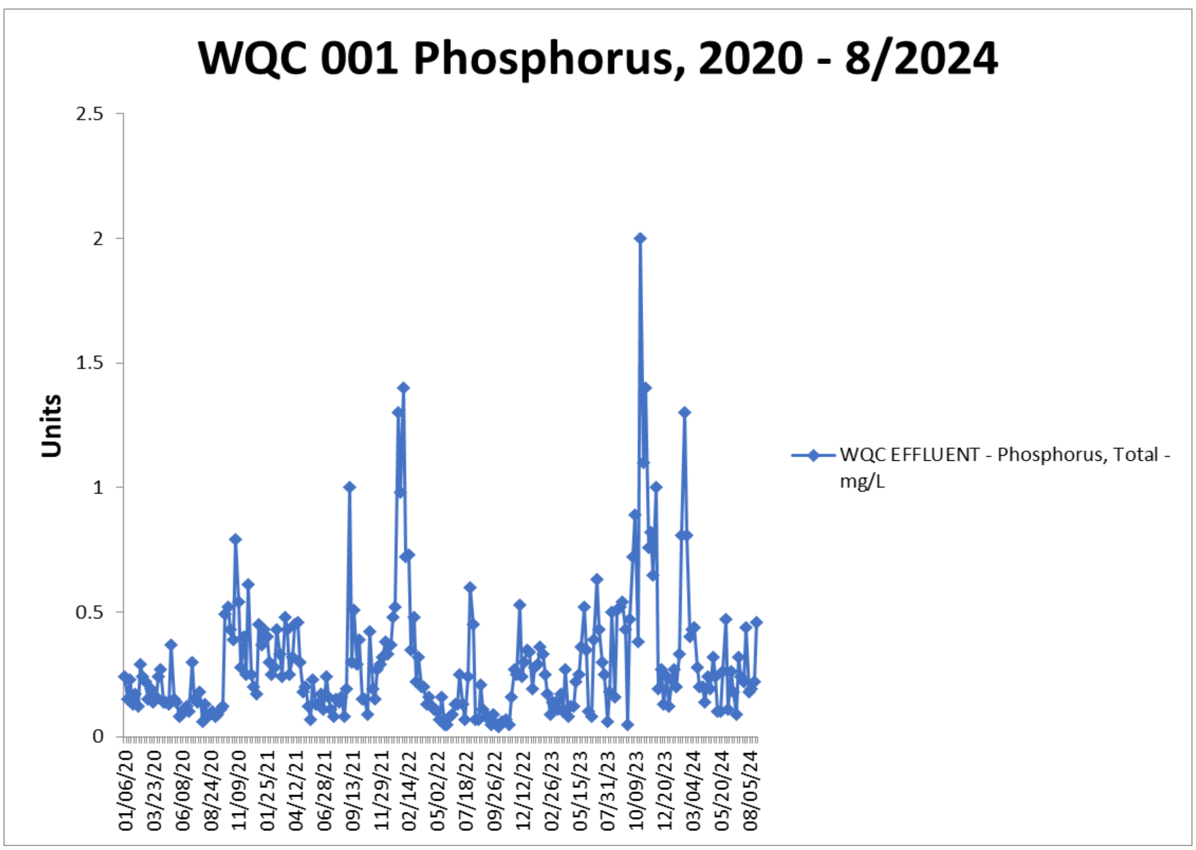
WQC EFFLUENT - BOD5, Total - lbs/day


WQC 001 BOD5 WLA, 2020 - 8/2024
Units
35000
30000
25000
20000
15000
10000
5000
0
05/01/20
06/08/20
07/16/20
08/23/20
09/30/20
05/07/21
06/14/21
07/22/21
08/29/21
10/06/21
05/13/22
06/20/22
07/28/22
09/04/22
10/12/22
05/19/23
06/26/23
08/03/23
09/10/23
10/18/23
05/25/24
07/02/24
08/09/24
WQC 001 014 016 020 COMBINED - WLA Adjusted Value - lbs/day
WQC 001 014 016 020 COMBINED - WLA BOD5 Discharged - lbs/day

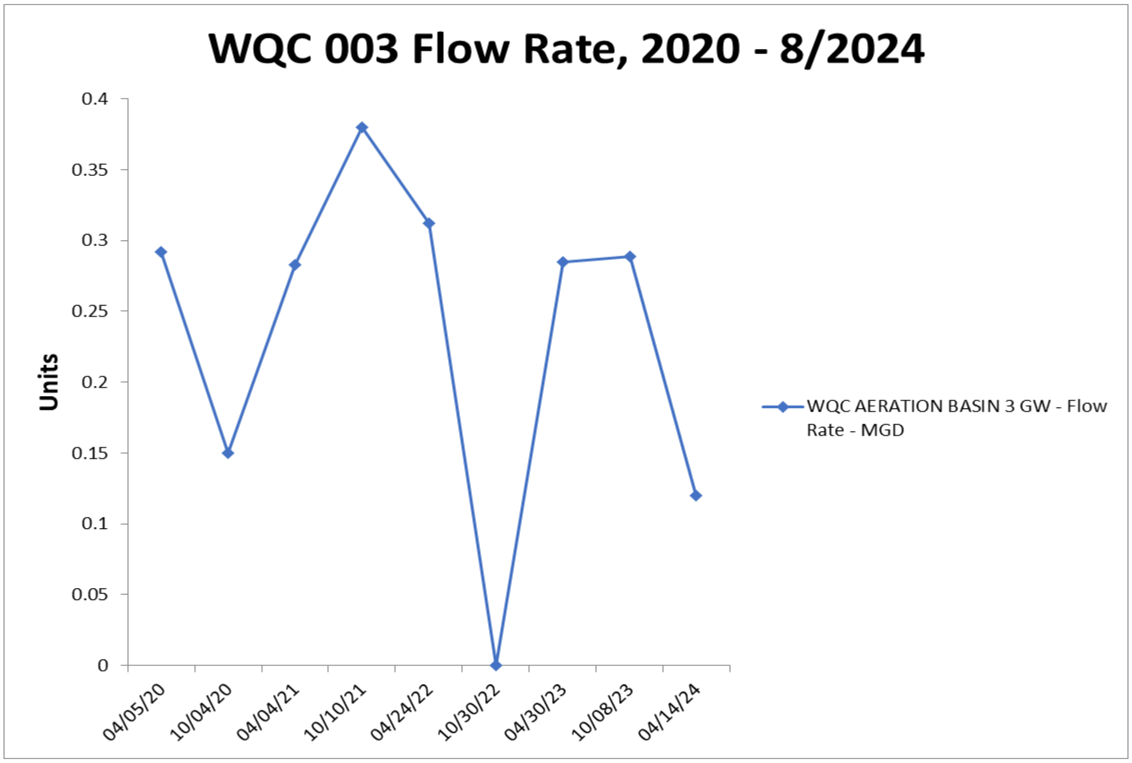

WQC 001 TSS, 2020 - 8/2024
Units
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
01/01/20
03/16/20
05/30/20
08/13/20
10/27/20
01/10/21
03/26/21
06/09/21
08/23/21
11/06/21
01/20/22
04/05/22
06/19/22
09/02/22
11/16/22
01/30/23
04/15/23
06/29/23
09/12/23
11/26/23
02/09/24
04/24/24
07/08/24
WQC 001 014 016 020 COMBINED - Suspended Solids, Total - lbs/day

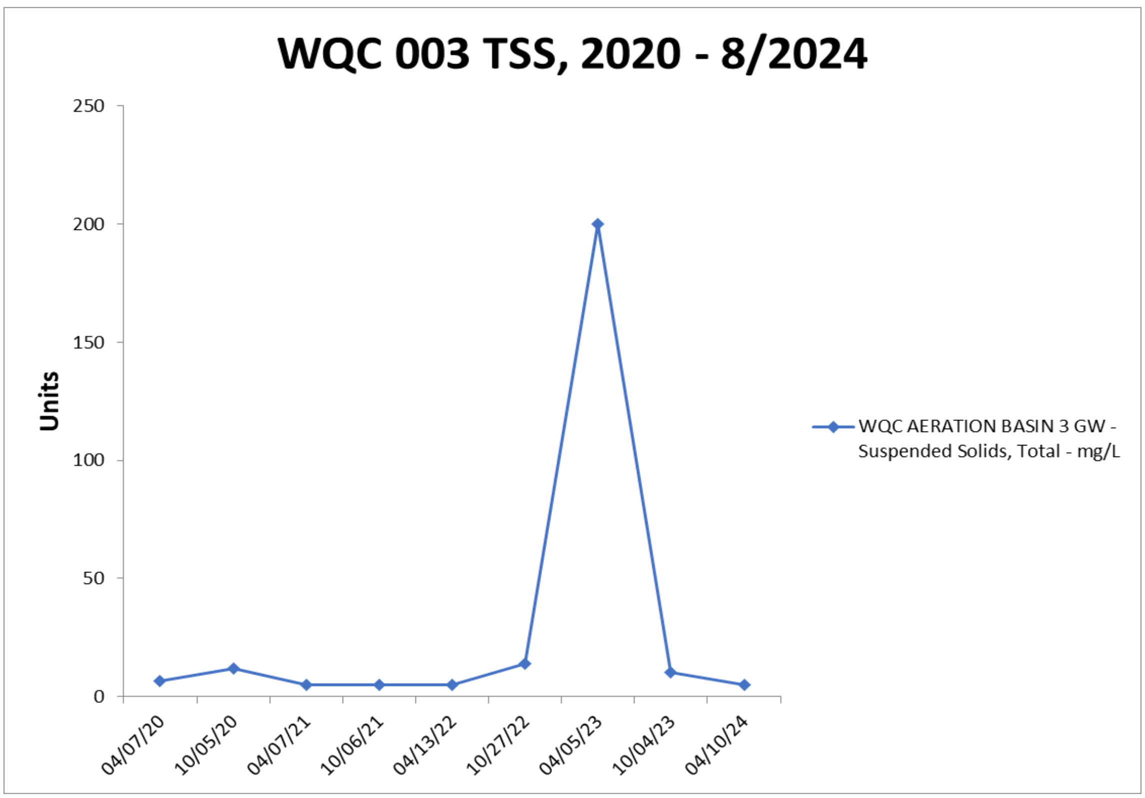

WQC 001 and 601 Hg, 2020 - 8/2024
Units
8
7
6
5
4
3
2
1
0
01/07/20
04/07/20
07/14/20
08/12/20
10/13/20
12/08/20
03/07/21
05/11/21
08/10/21
10/26/21
01/12/22
04/12/22
06/15/22
09/13/22
12/12/22
01/11/23
04/11/23
07/11/23
10/10/23
01/09/24
03/09/24
05/07/24
08/06/24
BM UPSTREAM MERCURY - Mercury, Total Recoverable - ng/L
WQC EFFLUENT - Mercury, Total Recoverable - ng/L

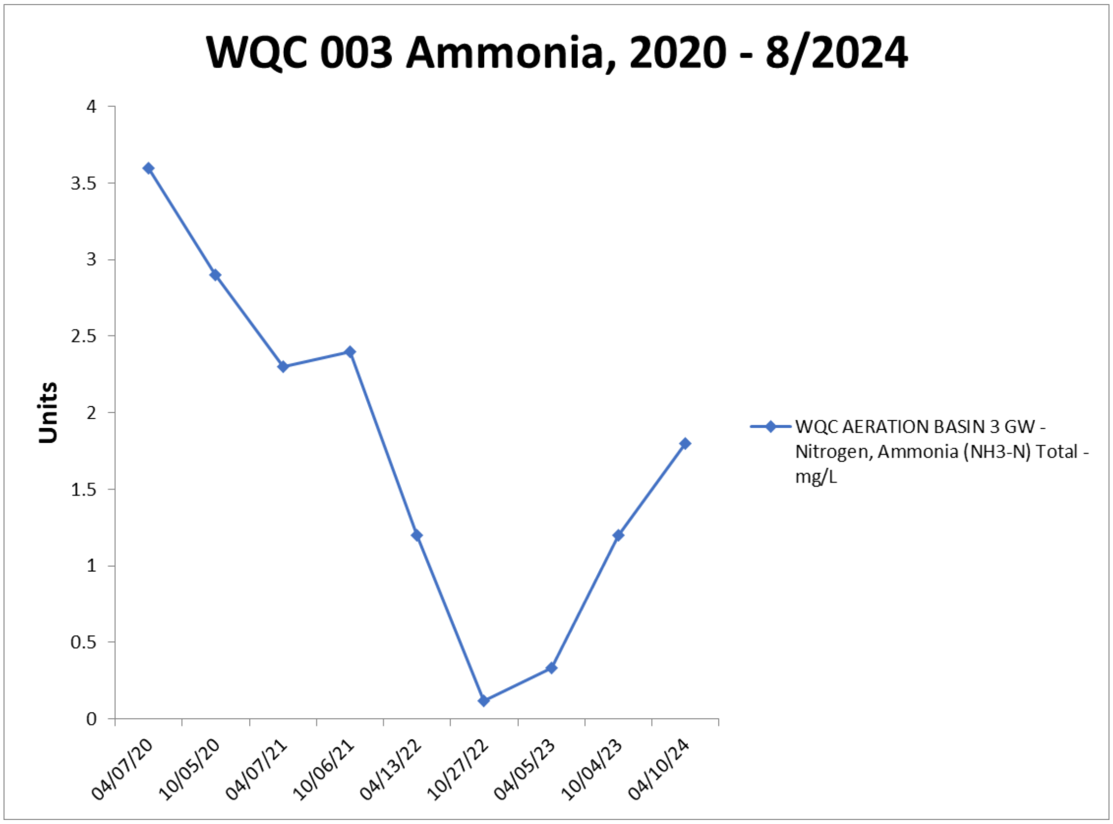

WQC 001 pH, 2020 - 8/2024
Units
10
9
8
7
6
5
4
3
2
1
0
01/01/20
03/16/20
05/30/20
08/13/20
10/27/20
01/10/21
03/26/21
06/09/21
08/23/21
11/06/21
01/20/22
04/05/22
06/19/22
09/02/22
11/16/22
01/30/23
04/15/23
06/29/23
09/12/23
11/26/23
02/09/24
04/24/24
07/08/24
WQC EFFLUENT - pH (Maximum) - su
WQC EFFLUENT - pH (Minimum) - su

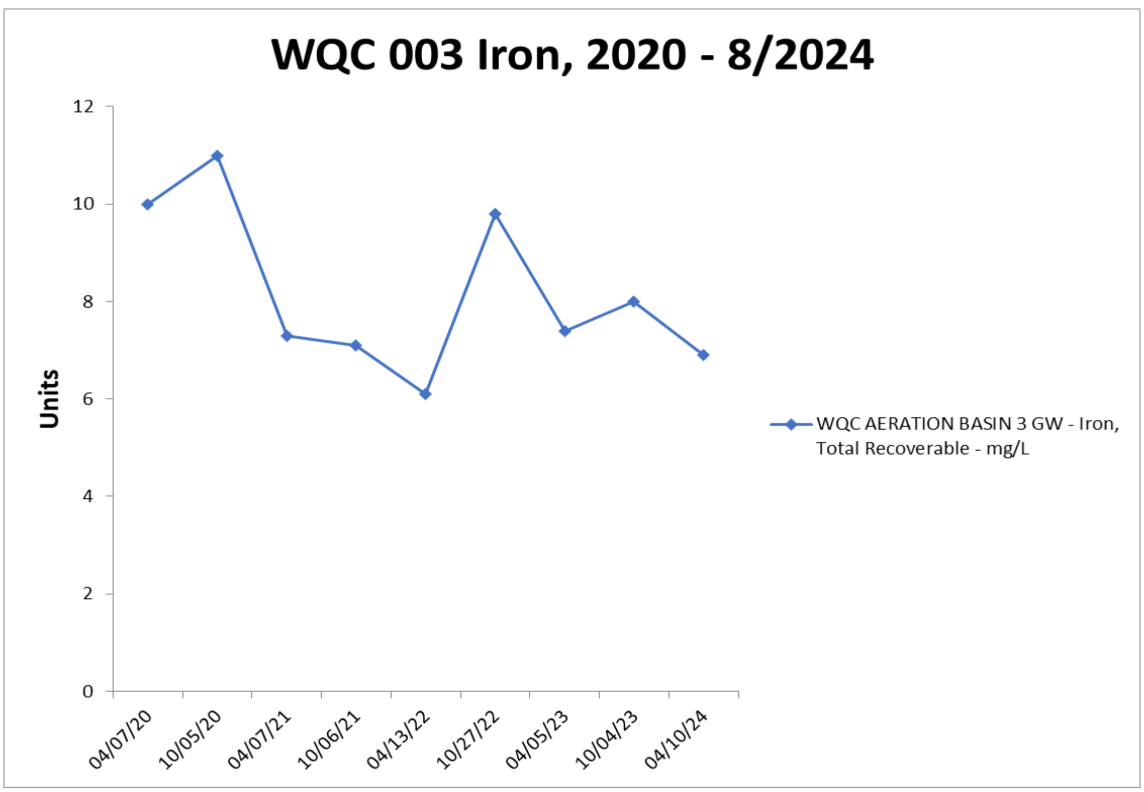

WQC 001 Phosphorus, 2020 - 8/2024
Units
2.5
2
1.5
1
0.5
0
01/06/20
03/23/20
06/08/20
08/24/20
11/09/20
01/25/21
04/12/21
06/28/21
09/13/21
11/29/21
02/14/22
05/02/22
07/18/22
09/26/22
12/12/22
02/26/23
05/15/23
07/31/23
10/09/23
12/20/23
03/04/24
05/20/24
08/05/24
WQC EFFLUENT - Phosphorus, Total - mg/L

003:

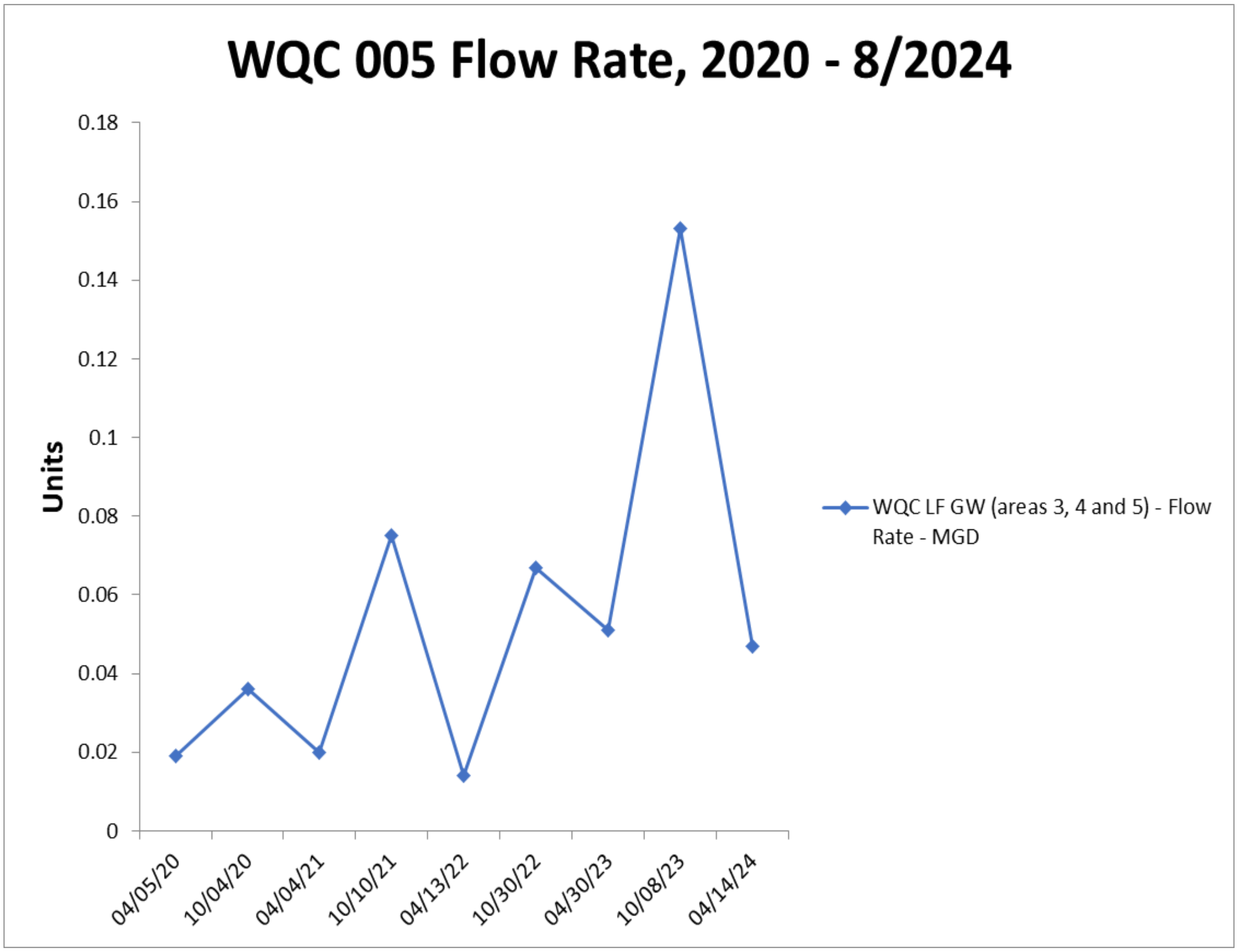

WQC 003 Flow Rate, 2020 - 8/2024
Units
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
04/05/20
10/04/20
04/04/21
10/10/21
04/24/22
10/30/22
04/30/23
10/08/23
04/14/24
WQC AERATION BASIN 3 GW - Flow Rate - MGD


WQC 003 TSS, 2020 - 8/2024
Units
250
200
150
100
50
0
04/07/20
10/05/20
04/07/21
10/06/21
04/13/22
10/27/22
04/05/23
10/04/23
04/10/24
WQC AERATION BASIN 3 GW - Suspended Solids, Total - mg/L


WQC 003 Ammonia, 2020 - 8/2024
Units
4
3.5
3
2.5
2
1.5
1
0.5
0
04/07/20
10/05/20
04/07/21
10/06/21
04/13/22
10/27/22
04/05/23
10/04/23
04/10/24
WQC AERATION BASIN 3 GW - Nitrogen, Ammonia (NH3-N) Total - mg/L


WQC 003 Iron, 2020 - 8/2024
Units
12
10
8
6
4
2
0
04/07/20
10/05/20
04/07/21
10/06/21
04/13/22
10/27/22
04/05/23
10/04/23
04/10/24
WQC AERATION BASIN 3 GW - Iron, Total Recoverable - mg/L

<u>005:</u>


WQC 005 Flow Rate, 2020 - 8/2024
Units
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
04/05/20
10/04/20
04/04/21
10/10/21
04/13/22
10/30/22
04/30/23
10/08/23
04/14/24
WQC LF GW (areas 3, 4 and 5) - Flow Rate - MGD

APPENDIX B-1

FULL BTA DETERMINATION:
BIRON MILL COOLING WATER INTAKE STRUCTURES

Author:
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Wastewater Engineer
Bureau of Water Quality

Date:
12/12/2024

1 Executive Summary

In conformity with Section 316(b) of the Clean Water Act, the location, design, construction, and capacity of cooling water intake structures should reflect the best technology available (BTA) for minimizing adverse environmental impacts. The department has made a Best Technology Available (BTA) determination for five cooling water intake structures (CWIS) utilized by ND Paper LLC's Biron Mill (NDP) in accordance with ch. NR 111, Wis. Adm. Code. The BTA for the CWIS is based on the required information submitted for a facility that withdraws greater than 2 MGD Design Intake Flow (DIF) and uses at least 25% of the total water withdrawn for cooling purposes. NDP is considered an existing facility for purposes of the rule because construction of the facility commenced prior to January 17, 2002 (s. NR 111.02(3)(a), Wis. Adm. Code). The department has concluded that existing impingement reduction measures at all five of NDP's intakes do not meet the standards for best technologies available for minimizing adverse environmental impact.

All five CWIS do not meet one of the impingement mortality standards in s. NR 111.12, Wis. Adm. Code, so a compliance schedule is proposed in the draft permit in accordance with s. NR 111.11(3)(a), Wis. Adm. Code.

The department must establish BTA standards for entrainment reduction for the intake on a site-specific basis (s. NR 111.13, Wis. Adm. Code). "These standards shall reflect the department's determination of the maximum reduction in entrainment warranted after consideration of the relevant factors as specified in subs. (2) and (3)." (s. NR 111.13, Wis. Adm. Code). After consideration of the factors specified in s. NR 111.13(2) and (3), Wis. Adm. Code, the department has concluded that the intake structures are considered the best technology available to achieve the maximum reduction in entrainment.

The BTA determination will be reviewed at the next permit reissuance and at subsequent reissuances in accordance with ch. NR 111, Wis. Adm. Code, as applicable. In subsequent permit reissuance applications, the permittee shall provide all the information required in s. NR 111.40(2)(b), Wis. Adm. Code, unless a request to reduce the information required has been submitted by the permittee and accepted by the department, as allowed by s. NR 111.42(1)(a), Wis. Adm. Code.

2 Background Information

NDP is situated on the eastern shore of the Wisconsin River in the town of Biron, Wisconsin. The mill was designed to withdraw water from the Wisconsin River through five different intake structures from an impoundment created by a dam that was constructed as part of the mill in the 1950s. One of the intakes is used solely for process water. The combined design intake flow (DIF) from the five active CWIS is 118.36 million gallons per day (MGD).

3 Intake Structures Descriptions

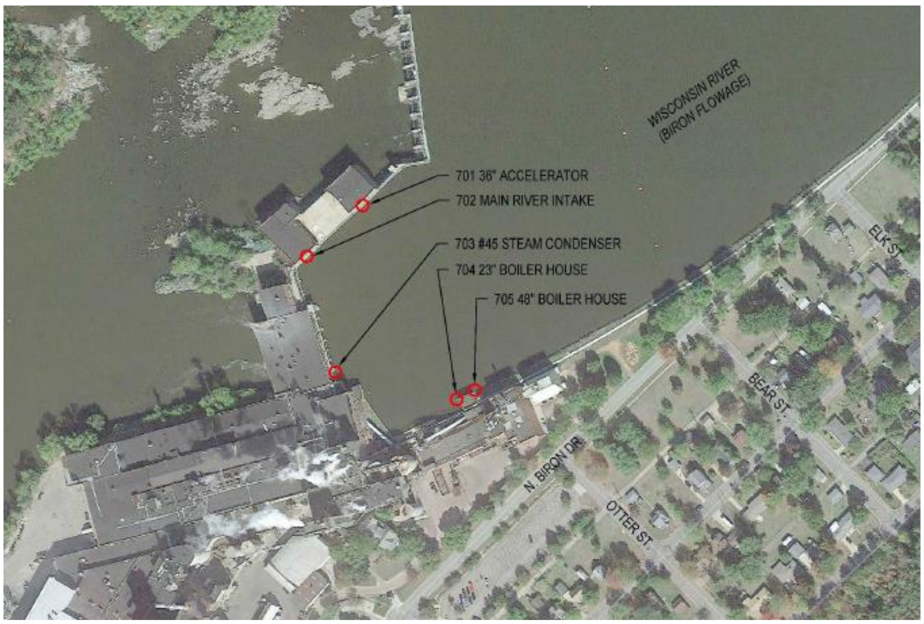
Each of the intake structures at Biron is located along the walls on the upstream side of the Biron Mill Dam. Three of the intakes are located on the right descending bank of the river (701, 702, and 703) and two on the left (704 and 705). Intakes

704 and 705 are equipped with traveling screens behind bar racks. Coordinates for each of the NDP intakes can be found in Table 1 below. For a map showing the approximate locations, see Figure 1.

Table 1 - Coordinates of Each Intake

Intake Name	Latitude	Longitude
701 (Accelator Intake)	44.4319°N	89.7792°W
702 (Main River Intake)	44.4317°N	89.7797°W
703 (Condenser #45 Intake)	44.4311°N	89.7794°W
704 (Boiler House 24" Intake)	44.4308°N	89.7784°W
705 (Boiler House 48" Intake)	44.4308°N	89.7783°W

Figure 1 - Map of Intake Locations



3.1 Accelator Intake (701)

The Accelator intake consists of a 36-inch diameter inlet cut into the retaining wall of Biron Dam on the north side of the Biron Flowage (Figure 2-3). The top of the inlet pipe is approximately 4 feet below the water surface. It was constructed in 1955 and has a maximum design intake capacity of 12 MGD with an AIF (2018 - 2022) of 0.55 MGD.

A trash rack is used to screen large debris before water enters the plant. The trash rack is 7 feet by 9 feet containing 0.25-inch vertical bars that are spaced 1.5 inches apart. Approximately 7 feet of the trash rack is below the water surface. The trash rack is cleaned periodically by manually raking the debris from the bars.

Intake water is conveyed into the Accelator (clarifier) by one 40 horsepower lift pump on an 18-inch line primary pump and one backup pump with a capacity of 8,000 gpm each. The recirculation water is returned to the intake upstream from the trash rack. Water processed by the Accelator is sent through coal filter beds into a clear well and is then used for process water. None of the water from Intake 701 is used for cooling purposes.

3.2 Main River Intake (702)

The Main River Intake consists of two separate 16-inch diameter openings (1.4 ft^2 each) in the dam retaining wall, two rotary drum screens and three intake pumps. The intake openings are 18 inches apart, located 4 feet below the water's surface at the mill's Filter Plant Building, and covered by a screen that the mill calls the "Shark Cage". The Shark Cage is 16 feet wide and 4 feet high and extends 4 feet out from the retention wall into the dam forebay. The side of the Shark

Cage opposite the intakes is covered by vertical bars that are ¼-inch thick, spaced 2.25 inches on center, and provides 89 percent open area. The remaining four sides of the Shark Cage are covered by steel plates with 1-inch diameter holes. Spacing of the holes is unknown, but commercially available perforated screen plate with 1-inch diameter holes provides an open area of 58%. Assuming an open area of 58%, the steel plated sides of the Shark Cage would provide an open area of 46 ft^2.

A rotary drum screen, 5 feet in diameter and 8 feet long with a 14-mesh (0.056" openings) coarse screen and 60-mesh (0.017" openings) fine screen, is located down-gradient from each intake (i.e., the two rotary drum screens treat separate intake flows). Intake water passes from inside the cylinder created by the drum screen to the outside for use in the mill. The rotary drum screens are immersed in the water to a depth of 2.5 feet, which provides a wetted area of 63 ft^2 for each drum screen and discharge screened water to a common wet well where the pumps are located.

Two of the three pumps at the main intake are rated at 3,000 gpm, (4.32 MGD), and the third pump is rated at 3,500 gpm (5.04 MG). One pump is maintained on standby. Design intake flow for the intake is 9.36 MGD. The actual intake flow for 2016 - 2019 was 0.27 MGD, all of which is used exclusively for cooling purposes.

3.3 Condenser #45 Intake (703)

The #45 Condenser Intake is in a hydro-turbine forebay adjacent to the mill's Grinder Building. A bar rack with dimensions of 16 feet-10 inches wide and a submerged depth of 12 feet-6 inches covers the inlet to the turbine forebay (210 ft^2). Vertical bars 3/8-inch thick on 3-inch centers make up the bar rack. Two 24-inch diameter pipes downgradient from the bar rack pull a side stream of water off the flow to the hydro-turbine for use as cooling water in the facility. Intake flow occurs mostly due to gravity since the steam condenser is located below the dam, but it is assisted by a steam-driven vacuum. The condenser intake water system is designed for 13,200 gpm (19 MGD) and with AIF of 7 MGD, all of which is used exclusively for cooling.

The cooling water is discharged back to the river via Outfall 013. Prior to #45 Condenser, the intake water passes through two self-cleaning strainers with baskets constructed with 3/16-inch diameter holes that provide a total flow through area of 21.2 ft^2. All of the water drawn through this intake is used for cooling purposes.

3.4 Boiler House 24" Intake (704)

The Boiler House 24-Inch Intake is a 30-inch diameter opening through the outer wall, the top of which is approximately 4 feet below the surface of the water. It was constructed in 1947 and has a maximum design intake capacity of 28 MGD, this is based on pipe capacity, as the intake is gravity-fed. The intake has an average intake flow rate of 11.3 MGD.

This intake has a trash rack to screen large debris from the intake water. The trash rack is located inside the building, is 9 feet by 6 feet and consists of 0.25-inch vertical bars spaced 3 inches apart. Approximately 8 feet of the rack is below the water surface. In addition, this intake has a REX traveling screen consisting of multiple screen panels that are 2 feet high by 6 feet wide with approximately 8 feet of screen below the water surface. The screens are 0.375-inch mesh and are rotated and cleaned periodically by a spray wash system. Through-screen velocity at DIF is calculated to be 1.35 fps. Debris is collected for off-site disposal. A 24-inch intake pipe conveys the water to the plant after passing through the traveling screen. All of the water drawn through this intake is used exclusively for cooling purposes.

3.5 Boiler House 48" Intake (705)

The Boiler House 48-Inch Intake consists of a 5-foot by 5-foot square opening to the river, the top of which is approximately 4 feet below the water surface on the south shore of the Biron Flowage. This intake is used to supply cooling water to the #1 steam condenser and inlet supply to the #26 River Water System. The intake was constructed in 1959 and has a design intake capacity of 50 MGD and an actual intake flow rate of 28.4 MGD.

The trash rack for this intake is inside the pump house and is 12.5 feet by 7 feet. It has 1/4-inch vertical bars spaced 3 inches apart. In addition, this intake also has a traveling screen with 0.375-inch mesh that is 7 feet wide by 15 feet deep, with 13 feet of screen below the water surface. Through-screen velocity at DIF is calculated to be 1.27 fps. The screens are periodically cleaned with a bar scraper and debris and impinged organisms are collected in a catch pan for off-site disposal.

A 48-inch intake pipe conveys water from the traveling screen by gravity to the condenser at the boiler house. Additionally, two variable frequency drive pumps draw water off the 48-inch intake pipe to provide 80 psi non-contact cooling water and process water to the paper mill. Each of these pumps has a capacity of 5,550 gpm (7.99 MGD), making the maximum capacity 11,100 gpm (15.98 MGD). All of the water drawn through this intake is used exclusively for cooling purposes.

3.6 Summary

The combined maximum design intake flow of all the NDP CWIS is 118.36 MGD. The annual water usage divided by the number of days in the year represents the average intake flow for that year. The 5-year running average of annual intake flows is the AIF as defined by the 316(b) rule. For the 5-year period from January 2018 through December 2022, the average aggregate intake flow of the five NDP CWIS was 47.4 MGD, or approximately 40% of DIF of 118.36 MGD.

4 Application Materials Submitted

As part of the WPDES Permit Application, NDP was required to submit information required under s. NR 111.41(1) through (8) and (13). NDP provided the information required under s. NR 111.41(1) through (8) and (13). The relevant application materials were included in a report titled "*Clean Water Act 316(b) Compliance Submittal Requirements per 40 CFR 122.21(r)(2) through (8)*", dated May 2019, and produced by Environmental Consulting and Technology, Inc (ECT).

In accordance with s. NR 111.11(1)(a), NDP is subject to the best technology available (BTA) standards for impingement mortality reduction under s. NR 111.12 and entrainment mortality reduction under s. NR 111.13, including any measures to protect federally-listed threatened and endangered species and designated critical habitat established under s. NR 111.14(7). A discussion on the BTA standards for impingement mortality is provided first followed by entrainment.

5 BTA Standards for Impingement Mortality

In accordance with s. NR 111.12(1)(a), NDP must comply with one of the alternatives in sub. 1. through 7. except as provided in sub. (b)1. or 2., when approved by the department. In addition, a facility may also be subject to the requirements of s. NR 111.12(2), Wis. Adm. Code, if the department requires such additional measures.

5.1 Collected Impingement Data

Impingement sampling was conducted by ECT at NDP from October 2012 through September 2013 on Intakes #701, 704, and 705. The dominant species impinged were channel catfish (51%) and black crappie (25%). The remaining 15 species at NDP accounted for 24% of the remaining fish, see Table 3 below for a summary of all impinged species.

Table 2 - 2012 - 2013 Impingement Sampling Results for NDP (Intakes 701, 704, and 705)

Species	701	704	705	Total	% of Total
Channel catfish	2	15	408	425	51.6%
Black crappie	0	3	201	204	24.8%
White bass	0	1	66	67	8.1%
Yellow bullhead	0	5	32	37	4.5%
Emerald Shiner	0	0	24	24	2.9%
Bluegill	0	0	22	22	2.7%
Trout perch	0	0	13	13	1.6%
Spottail shiner	0	0	9	9	1.1%
White crappie	0	0	5	5	0.6%
Lake Sturgeon	0	0	4	4	0.5%
Smallmouth bass	0	0	4	4	0.5%
Walleye	0	0	3	3	0.4%
Golden Shiner	0	0	3	3	0.4%
Banded Darter	0	0	1	1	0.1%
Carp	0	0	1	1	0.1%
Fathead Minnow	0	0	1	1	0.1%
Pumpkinseed	0	1	0	1	0.1%
Total	**2**	**25**	**797**	**824**	

5.2 IM Option 1: Closed Cycle Recirculating System

NDP has rejected this option as it pertains to IM BTA. An evaluation of the Biron Mill shows that no space is available for installation of this equipment. NDP claims that costs are prohibitive relative to other alternatives for IM BTA and the use of closed-cycle cooling is not compatible with several of the uses of intake water.

5.3 IM Option 2: 0.5 Feet per second maximum design intake velocity

One option for compliance with the impingement mortality BTA standard is achieving 0.5 Feet per second maximum design intake velocity (s. NR 111.12(1)(a)2., Wis. Adm. Code). As the basis for the department's determination, the owner or operator of the facility shall demonstrate that the cooling water intake structure has a maximum design intake velocity less than or equal to 0.5 feet per second under all conditions. The owner or operator of the facility shall submit information to the department that demonstrates that the maximum design intake velocity does not exceed 0.5 feet per second.

S. NR 111.03(26), Wis. Adm. Code defines 'Maximum design intake velocity' as:

"*The value assigned during the cooling water intake structure design to the maximum instantaneous speed at which the cooling system is capable of withdrawing water through the intake screen or inlet from a source waterbody, applied at all points between the point at which water is withdrawn from a water of the state and the first screen or other structure that has a mesh with a maximum distance in the openings of 0.56 inches, and calculated using the following equation:* $V = Q/(A * P)$ *where*

V = the maximum design intake velocity,
Q = the maximum volumetric flow rate based on pump capacities, excluding emergency and redundant pumps.
A = typical wetted area of the screen at $Q_{7,10}$ *flows.*
P = screen open area percentage divided by 100.

For a facility that uses other intake designs that do not use a screen, the maximum design intake velocity shall be determined using an alternate method approved by the department."

Intake Velocity Calculation

The predicted maximum design intake velocity and actual intake velocity for NDP's various intakes are summarized in Table 1 below.

Table 3 - Summary of Intake Velocities

Intake Name	DIF (MGD)	AIF (2018 – 2022, MGD)	Flow Area* (ft2)	Design Intake Velocity (ft/s)	Actual Intake Velocity (ft/s)
701 Accelator	12	0.55	7.07	**2.63**	0.12
702 Main River	9.36	0.27**	2.79	**5.19**	0.15
703 Condenser 45	19	7.04	6.28	**4.68**	**1.73**
704 Boiler House 24"	28	11.31	32	**1.35**	**0.55**
705 Boiler House 48"	50	28.37	60.8	**1.28**	**0.72**
Total Flows	**118.36**	**47.53**			

*Flow area based on the cross-sectional area of the intake pipe for intakes with >0.56" openings. These are intakes 701, 702, and 703.
**This flow rate was calculated taking the average from 2016 – 2019, as the facility has reported that this intake has not withdrawn water since 2018.

$$701: V = \frac{Q}{A*P} = \frac{12{,}000{,}000\frac{gal}{day}*\frac{1\,ft^3}{7.48\,gal}*\frac{1\,day}{86{,}400\,sec}}{\pi*\left(\frac{18\,inches}{12\frac{inches}{ft}}\right)^2*1} = 2.63\ ft/s$$

$$702: V = \frac{Q}{A*P} = \frac{9{,}360{,}000\frac{gal}{day}*\frac{1\,ft^3}{7.48\,gal}*\frac{1\,day}{86{,}400\,sec}}{2*\pi*\left(\frac{8\,inches}{12\frac{inches}{ft}}\right)^2*1} = 5.19\ ft/s$$

$$703: V = \frac{Q}{A*P} = \frac{19{,}000{,}000\frac{gal}{day}*\frac{1\,ft^3}{7.48\,gal}*\frac{1\,day}{86{,}400\,sec}}{2*\pi*\left(\frac{12\,inches}{12\frac{inches}{ft}}\right)^2*1} = 4.68\ ft/s$$

$$704: V = \frac{Q}{A*P} = \frac{28{,}000{,}000\frac{gal}{day}*\frac{1\,ft^3}{7.48\,gal}*\frac{1\,day}{86{,}400\,sec}}{8ft*6ft*0.665} = 1.35\ ft/s$$

$$705: V = \frac{Q}{A*P} = \frac{50{,}000{,}000\frac{gal}{day}*\frac{1\,ft^3}{7.48\,gal}*\frac{1\,day}{86{,}400\,sec}}{7ft*13ft*0.665} = 1.28\ ft/s$$

Intakes 701, 702, and 703, while they all have DIF <0.5 ft/s when calculated at the current bar racks that are utilized, do not have properly sized screens where impingement can be measured. Therefore, the 0.5 ft/s threshold must be met at all points in the intake. Based on the available information, none of the intakes meet this impingement mortality standard.

5.4 IM Option 3: 0.5 Feet per second actual intake velocity

NDP has initially rejected this option as they are unwilling to put flow restrictions on the various process and cooling water systems to maintain full operational capabilities at the Biron Mill.

5.5 IM Option 4: Existing offshore velocity cap

This option is not available to NDP as they do not operate an existing offshore velocity cap that was installed on or before October 14, 2014.

5.6 IM Option 5: Modified traveling screens

NDP has evaluated this option and determined that it is likely cost prohibitive. The traveling screen systems in place at Intakes 704 and 705 are not standard types most often used at power plants that industry has designed to be retrofitted with modified traveling water screens. Retrofitting the existing traveling screens would require custom design, but that also assumes that if retrofitting is even possible. NDP has determined that total replacement of the existing systems is more likely which could also require modification or replacement of the existing screen house. Additionally, to return the impingement fish to the river where they would not be subject to re-impingement, the fish return trough would need to be routed to the downstream side of the Biron Dam, approximately 500 feet, through existing industrial buildings and the dam itself.

5.7 IM Option 6: Systems of technologies as the BTA for impingement mortality

NDP has initially rejected this compliance option as they have determined that the requirement for impingement monitoring for system optimization is not possible at some of the intakes and no system of measures is advantageous compared to other alternatives.

5.8 IM Option 7: Impingement mortality performance standard

NDP has rejected this option due to the regulatory risk associated with ongoing performance monitoring and the performance standard. As a result, NDP also estimates that costs are not reduced relative to other options.

6 Assessment of Achieving Design Intake Velocity <0.5 ft/s

6.1 Reduction in Flow (DIF)

NDP has assessed the possibility of reducing DIF at two of the intakes and determined that reducing DIF at 704 and 705 to where the velocity is below 0.5 ft/s is infeasible as those flow rates would need to be below the AIF. This evaluation was not done for intakes 701, 702, or 703.

6.2 Increase Screen Area

NDP has studied the possibility of increasing cross-sectional area for flow as a means of reducing intake velocity for two of their five intakes.

6.2.1 Intakes 701, 702 and 703

Increasing the screen area was not evaluated for these intakes as the ECT report assumed that these intakes were already compliant with the <0.5 ft/s maximum design intake velocity IM option. As indicated above, the facility will need to install screens at these intakes with <0.56" openings to fully evaluate the IM compliance options. This action may or may not result in a maximum design intake velocity of 0.5 ft/s or less at the intake.

To determine whether installing an appropriately sized screen will result in compliance with this impingement mortality standard, the department compared the "Area at 0.5 ft/s" results in Table 2-4 of NDP's application submittal with an assumed open area for a screen with <0.56" openings. From this, it's evident that the permittee will likely be able to comply with this standard for intakes 702 and 703, but compliance through Intake 701 will require another type of upgrade.

6.2.2 Intakes 704 and 705

Intakes 704 and 705 are located at the Boiler House Intake Building with intake openings less than 50 feet apart from each other on the same wall. Each intake could be fitted with its own screening system or a single screened structure could provide water to both intakes. Intake 705 requires 155 ft^2 of flow area and Intake 704 requires 87 ft^2 to achieve 0.5 fps intake velocity. If one structure was constructed, it would need a combined flow area of 242 ft^2 to allow full DIF to both intakes at the same time. ND Paper has assumed that the new structures would include a forebay extending approximately 10 feet from the face of the building into the river with the screening on the long side facing the river.

This option will involve obtaining permits for construction in a navigable waterway through the Corps of Engineers and will incur substantial capital costs. The exact configuration of the screening structures would be determined through final design, but the open area of at least 155 ft2 for Intake 705 and 87 ft2 for Intake 704 would be specified.

7 Chosen Compliance Option: BTA for Impingement Mortality

The department does not concur that that CWIS for intakes 701, 702, 703, 704, and 705 are BTA for impingement mortality as currently installed. NDP will be required to modify the structures of all intakes in order to reduce the intake velocity to below 0.5 ft/s through installation of a new screening system, or otherwise come into compliance with one of the other impingement mortality options identified above.

8 BTA Standards for Entrainment

The permittee proposes that the design and operation of the intake meets the BTA standards for entrainment mortality reduction. The department has evaluated this proposal under s. NR 111.13 and recommends the approval of this proposal. Below is a written explanation of the proposed entrainment determination as required by s. NR 111.13(1).

For entrainment control, the regulations expressly call for the permitting agency to make a site-specific determination of which technologies and/or practices satisfy the BTA standard for each individual facility (s. NR 111.13, Wis. Adm. Code). The BTA "shall reflect the department's determination of the maximum reduction in entrainment warranted after consideration of the relevant factors as specified in subs. (2) and (3)." The regulations also give the department the discretion to reject an otherwise available technology as the BTA for entrainment if the social costs are not justified by the social benefits or if there are other unacceptable adverse factors that cannot be mitigated (s. NR 111.13(4)).

The proposed determination must be based on consideration of any additional information required by the department and the factors listed in s. NR 111.13(2)(a). The weight given to each factor is within the department's discretion based upon the circumstances of each facility. In addition, the proposed determination may be based on consideration of the factors listed in s. NR 111.13(3).

In accordance with s. NR 111.13(2), the following factors must be considered:

1. Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species, and designated critical habitat (e.g., prey base);
2. Impact of changes in particulate emissions or other pollutants associated with entrainment technologies;
3. Land availability inasmuch as it relates to the feasibility of entrainment technology;
4. Remaining useful plant life; and
5. Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

In accordance with s. NR 111.13(3), the following factors may be considered in determining a site-specific BTA:

1. Entrainment impacts on the waterbody;
2. Thermal discharge impacts;
3. Credit for reductions in flow associated with the retirement of units occurring within the ten years preceding October 14, 2014;

4. Impacts on the reliability of energy delivery within the immediate area;
5. Impacts on water consumption; and
6. Availability of process water, gray water, wastewater, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.

In the preamble to the 316(b) Rule (79 Fed. Reg. 48300 at 48303), USEPA indicated the following:

> *The entrainment provision reflects EPA's assessment that there is no single technology basis that is BTA for entrainment at existing facilities, but instead a number of factors that are best accounted for on a site-specific basis. Site-specific decision making may lead to a determination by the NPDES permitting authority that entrainment requirements should be based on variable speed pumps, water reuse, fine mesh screens, a closed-cycle recirculating system, or some combination of technologies that constitutes BTA for the individual site. The site-specific decision-making may also lead to no additional technologies being required.*

Candidate entrainment control technologies are provided in s. NR 111.41(13), including a closed cycle recirculation system, fine mesh screens with a mesh size of 2 mm or smaller, and water reuse or alternate sources of cooling water, and variable speed pumps (i.e., variable frequency drive pumps).

9 Entrainment Performance Evaluation

9.1 Entrainment Characterization Data

Entrainment data used for evaluating NDP's intake structures was collected April through September 2018 at Intake #705. A summary of the entrainment data collected at the Biron Boiler House can be found in Tables 4 and 5 below. Using the Biron intake entrainment densities, actual intake flows reported during the study and AIF as projected annual flow, annual entrainment estimates for NDP totaled 18.2 million ichthyoplankton, or approximately 1.5% of all entrainable organisms in this segment of the Wisconsin River. Overall, Cyprinidae sp., Cyprinidae type, Ictiobinae sp., and Burbot were the dominant taxa entrained in 2018, accounting for 45.5, 21.7, 9.3, and 9.1% of the annual estimated entrainment, respectively, at the Intake.

A total of 4,779 ichthyoplankton were collected during the 2018 entrainment study representing eight families and 34 taxa, with a total density of 52.2 specimens per 100 cubic meters (#/100 m3). Cyprinidae was the most abundant family, accounting for nearly 70% of the total ichthyoplankton collected with a total density of 36.5/100 m^3. Within the Cyprinidae group, Cyprinidae sp. (40.5%), followed by Cyprinidae type (22%) were the most abundant taxa collected. Other dominant taxa included Ictiobinae sp., Lepomis sp., Burbot, and Common Carp, each accounting for 5.6 to 12.2% of the total ichthyoplankton with overall densities ranging from 2.0 to 6.4/100 m^3. Besides unidentified ichthyoplankton (2.6%), Emerald Shiner type (1.5%), and Pimephales type (1.3%), no other taxa accounted for >1% of the total composition. No federally listed or state-listed species were identified during the study.

Recreational taxa collected during the study included Common Carp, Burbot, all Catostomids (suckers), Ictalurids (catfishes), Moronidae (temperate basses), Centrarchids (sunfishes) and some Percids (Yellow Perch, Sauger, and Sander sp.). Game fish comprised less than 8% of the total number of ichthyoplankton collected. Seasonal ichthyoplankton densities increased by mid-spring and peaked in the late spring/early summer, and then declined in August. Ichthyoplankton were not collected in the September samples.

Table 4 - Summary of Entrainment Characterization Data Collected at Biron Mill April - September 2018

Taxonomic Group	Taxa	Number	%	Density (#/100m3)
CYPRINIDAE (Carps and Minnows)	COMMON CARP	186	3.9	2.0
	SHINER type	7	<1	0.1
	EMERALD SHINER	8	<1	0.1
	EMERALD SHINER type	73	1.5	0.8
	SPOTTAIL SHINER type	4	<1	0.0
	MIMIC SHINER type	1	<1	0.0
	Notropis sp.	11	<1	0.1
	Pimephales type	62	1.3	0.7
	Pimephales sp.	3	<1	0.0
	CYPRINIDAE type	1,052	22	11.5
	CYPRINIDAE sp.	1,935	40.5	21.1
CATOSTOMIDAE (Suckers)	Moxostoma sp.	1	<1	0.0
	CATOSTOMINAE sp.	1	<1	0.0
	ICTIOBINAE sp.	583	12.2	6.4
ICTALURIDAE (Catfishes)	YELLOW BULLHEAD	2	<1	0.0
	CHANNEL CATFISH	1	<1	0.0
PERCOPSIDAE (Trout-Perches)	TROUT-PERCH	3	<1	0.0
GADIDAE (Codfishes)	BURBOT	266	5.6	2.9
MORONIDAE (Temperate Basses)	WHITE BASS	3	<1	0.0
	YELLOW BASS	1	<1	0.0
	Morone sp.	16	<1	0.2
CENTRACHIDAE (Sunfishes)	BLUEGILL	27	0.6	0.3
	Lepomis sp.	332	6.9	3.6
	Pomoxis sp.	1	<1	0.0
PERCIDAE (Perches)	Etheostoma type	10	<1	0.1
	BANDED DARTER type	4	<1	0.0
	Etheostoma sp.	1	<1	0.0
	YELLOW PERCH	6	<1	0.1
	Catonotus type	1	<1	0.0
	Percina type	24	0.5	0.3
	SAUGER	1	<1	0.0
	Sander sp.	6	<1	0.1
	LOGPERCH type	17	<1	0.2
	DARTER sp.	4	<1	0.0
UNIDENTIFIED		126	2.6	1.4
Total		**4,779**	**100**	**52.2**

Table 5 - Annual Entrainment Estimates at NDP

Extrapolation Period	Biron Mill Intake 705	NDP (All Intakes)
APR 1-30	867,403	1,429,313
MAY 1-15	76,083	141,272
MAY 16-31	1,371,781	2,547,163
JUN 1-15	2,568,582	4,565,096
JUN 16-30	1,914,051	3,401,810
JUL 1-15	803,676	1,303,296
JUL 16-31	822,563	1,333,925
AUG 1-31	1,522,514	2,479,602
SEP 1-30	0	0
Total	**9,946,653**	**17,201,477**

9.2 Current Entrainment Control Measures

The primary reduction mechanisms for entrainment at NDP are through reduction of actual intake flow compared to DIF (AIF is 40% of DIF) and location of two of the intakes offshore in the main river stem away from commonly used shoreline habitat and where there are strong sweeping velocities (Intakes 701, and 702). These intakes also withdrawal a very small percentage of the mean annual river flow (1.4%). The following sections summarize current measures for each specific intake.

Intake 701

AIF is 4.6% of DIF. Offshore intake location.

Intake 702

AIF is 3% of DIF. Offshore intake location.

Intake 703

AIF is 37% of DIF.

Intake 704

AIF is 40% of DIF.

Intake 705

AIF is 57% of DIF.

10 Evaluation of Other Candidate Entrainment Control Technologies

Since NDP does not currently employ any entrainment reduction measures other than reduced intake flows and utilizing offshore intakes, the department evaluated the other remaining candidate entrainment control technologies in order to make the BTA determination. Below is an evaluation of the candidate technology:

10.1 TECHNOLOGY: Mechanical Draft Cooling Towers (closed-cycle recirculating system)

1.1. FACTOR s. NR 111.13(2)(a)1., Wis. Adm. Code: Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base).

A closed cycle recirculating system (CCRS) would potentially reduce entrainment. This is because entrainment reductions are directly proportional to flow reductions. As discussed in the 316(b) Rule Preamble, mechanical draft cooling towers operating in freshwater sources can achieve flow reductions of 97.5 percent (based on a cycle of concentration of 3.0). 79 Fed. Reg. 48300 at 48338. Therefore, USEPA estimates that freshwater cooling towers, compared to once-through cooling systems, reduce impingement mortality and entrainment by 97.5 percent.[1] However, the only flow which would be reduced would be cooling water flows and not process wastewater flows, so the actual reductions would be less in this case (90%).

Mechanical draft cooling towers (MDCT) are large facilities often associated with power generating stations. These structures use large flows of water through the towers along with a mechanical fan to create differential pressure between the tower interior and exterior, inducing a draft through the tower, and exhausting at the top the tower as a warm vapor plume. These systems require a large footprint, a significant amount of energy, and a large cooling water flow to operate. MDCTs can be in a rectilinear arrangement or in a circular arrangement. MDCTs can achieve the heat loss for NDP and can be considered a potential technology to decrease entrainment.

1.2. FACTOR s. NR 111.13(2)(a)2., Wis. Adm. Code: Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

Installation of mechanical draft cooling towers would result in increased air emissions, and a new emission source. While any tower would likely utilize plume abatement technology, the towers would produce visibility reduction due to fogging, ice formation on surfaces downwind from the cells, and visual pollution as perceived by receptors adjacent to NDP.

It is expected that the parasitic load created by the addition of the tower fans and pump station would cause an energy penalty that would be replaced by a nearby fossil fuel burning facility, which would lead to an increase in gas combustion emissions.

Energy would also need be replaced by nearby fossil fuel burning facilities during the process of retrofitting NDP for a CCRS.

1.3. FACTOR s. NR 111.13(2)(a)3., Wis. Adm. Code: Land availability inasmuch as it relates to the feasibility of entrainment technology.

The availability of space for infrastructure was considered in the assessment of entrainment BTA. Due to available space being re-allocated for a new wastewater treatment system, the footprint of the facility is too small to allow the installation of a MDCT.

1.4. FACTOR s. NR 111.13(2)(a)4., Wis. Adm. Code: Remaining useful plant life.

This BTA determination assumes that the NDP will have several years of operational viability.

1.5. FACTOR s. NR 111.13(2)(a)5., Wis. Adm. Code: Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

NDP has estimated the cost to retrofit the existing facility with cooling towers would be $39 million (as of date of report – May 2019). The facility believes the potential reduction in existing entrainment rates (1.4% of entrainable organisms) does not outweigh the significant costs that would be incurred.

1.6. FACTOR s. NR 111.13(3)(a), Wis. Adm. Code: Entrainment impacts on the waterbody.

It is unlikely that reducing entrainment by 90% would have a large impact on the ecosystem surrounding the intake structure.

1.7. FACTOR s. NR 111.13(3)(b), Wis. Adm. Code: Thermal discharge impacts.

Cooling towers would decrease thermal impacts in limited areas around outfalls, but have little effect on river overall based on the thermal discharge relative to river flow.

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[1] USEPA. Technical Development Document for the Final Section 316(b) Existing Facilities Rule. EPA-821-R-14-002. May 2014.

1.8 Summary/Conclusion

Mechanical Draft Cooling Tower would potentially reduce entrainment due to decreased flows. However, other unacceptable adverse factors that cannot be mitigated make this technology unavailable at NDP. Factors contribute to making this technology infeasible, including:

1. Increase in particulate emissions (which would likely require a minor source air permit),
2. Increased energy usage,
3. Increased chemical usage
4. Net social costs outweigh social benefits.

For all of these reasons, the department has rejected additional mechanical draft cooling towers/closed cycle cooling as an option for NDP.

10.2 TECHNOLOGY: Fine Mesh Screens

2.1. FACTOR s. NR 111.13(2)(a)1., Wis. Adm. Code: Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base).

Fine mesh screens would potentially reduce entrainment by physically preventing the passage of eggs and larvae further into the plant. This is because the openings in a fine mesh screen are smaller than many fish eggs and larvae. Entrainment reduction percentages through the use of fine mesh screens vary widely from facility to facility but in the alternative analysis that was submitted with NDP’s permit reissuance application NDP simply notes that the existing entrainment numbers are not having a significant effect on the receiving waterbody. Furthermore, these eggs and larvae could potentially end up being impinged on the mesh screens and die anyway.

2.2. FACTOR s. NR 111.13(2)(a)2., Wis. Adm. Code: Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

Installation of fine mesh screens are not anticipated to have an effect on the particulate emissions from NDP.

2.3. FACTOR s. NR 111.13(2)(a)3., Wis. Adm. Code: Land availability inasmuch as it relates to the feasibility of entrainment technology.

Land availability is not typically a concern for the use of fine mesh screens since they are installed in the source waterbody. However, NDP has noted that retrofitting with fine mesh screens would require greatly expanding existing intake structures or installation of new, larger ones, requiring permitting and extensive construction within the river.

2.4. FACTOR s. NR 111.13(2)(a)4., Wis. Adm. Code: Remaining useful plant life.

See the previous discussion on this factor in the section for mechanical draft cooling towers above.

2.5. FACTOR s. NR 111.13(2)(a)5., Wis. Adm. Code: Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

Installation of new fine mesh screen systems would require combining intakes which are widely separated. Cost of retrofitting or installing new fine mesh screens, estimated to be approximately $2.2 million. Operation of FMS would also result in increased clogging.

2.6. Summary/Conclusion

Fine mesh screens would potentially reduce entrainment by physical exclusion of anything larger than the slot size of the mesh. Primarily due to the social costs of this technology significantly outweighing the benefits, the department has rejected the use of fine mesh screens at NDP as BTA.

10.3 TECHNOLOGY: Water Reuse or Alternative Sources of Cooling Water

3.1. FACTOR s. NR 111.13(2)(a)1., Wis. Adm. Code: Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base).

Water reuse and alternative sources of cooling water may potentially reduce entrainment by reducing the intake flow from the source water. As discussed with mechanical draft cooling towers reductions in entrainment are directly proportional to flow reductions. The entrainment reductions from water reuse or an alternative source of cooling water vary based how much of the cooling water required by the facility can be provided through reuse or an alternative source. The facility has not indicated how much NCCW could be reused as process wastewater. However, since process wastewater only comprises 10% of the facility's DIF, these reductions through reuse would be minimal.

3.2. FACTOR s. NR 111.13(2)(a)2., Wis. Adm. Code: Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

NDP does not anticipate that particulate emissions would be affected by utilizing an alternative source or re-using NCCW or process wastewater.

3.3. FACTOR s. NR 111.13(2)(a)3., Wis. Adm. Code: Land availability inasmuch as it relates to the feasibility of entrainment technology.

Many of the systems served by CWISs are inside existing mill buildings. Installing new piping systems or modifying existing infrastructure would cause extensive disruption of existing equipment and structures. Similarly, conveying water to the site would involve new pipelines.

3.4. FACTOR s. NR 111.13(2)(a)4., Wis. Adm. Code: Remaining useful plant life.

See the previous discussion on this factor in the section for mechanical draft cooling towers above.

3.5. FACTOR s. NR 111.13(2)(a)5., Wis. Adm. Code: Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

No nearby water source is available. Some water re-use is already done for ice control. NDP anticipates that the cost involved with re-plumbing existing systems and conveying water to the mill greatly exceeds the expected potential benefit considering the relative low impact the mill currently has on the river. Nearest POTW (gray water) or potable water sources do not have sufficient capacity to supply the mill.

3.6. Summary/Conclusion

Water reuse and alternative sources of cooling water may reduce entrainment due to the reduction in the required intake flow. However, reuse of POTW effluent is not ideal given the constraints associated with existing operations. The department has thus rejected water reuse or alternative sources of cooling water as BTA for NDP primarily due to the significant difference anticipated between social costs and benefits.

10.4 TECHNOLOGY: Variable Speed Pumps

4.1. FACTOR s. NR 111.13(2)(a)1., Wis. Adm. Code: Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base).

Variable speed pumps would potentially reduce entrainment by reducing flow when less than the full flow that the pump is able to provide is needed. The reduction in entrainment provided by VSPs is dependent on when flow reductions occur in relation to the productive periods of the source waterbody. NDP believes that flow reductions based on installation of VSPs would be minimal, as mill processes, when operational, require the full pump capacity to supply mill water needs. The reason for this is VSPs are already imitated by the mill only turning on the individual pumps which are needed. That, and intake 704 is gravity-fed, dependent on need. The AIF across the entire mill reflects this process. Furthermore, three of the intakes withdraw water through gravity flow, and do not operate pumps.

4.2. FACTOR s. NR 111.13(2)(a)2., Wis. Adm. Code: Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

It is unlikely that the installation or use of VSPs would lead to significant changes in the emission of particulates or other pollutants.

4.3. FACTOR s. NR 111.13(2)(a)3., Wis. Adm. Code: Land availability inasmuch as it relates to the feasibility of entrainment technology.

Land availability should not be a concern in the implementation of VSPs since they can be installed in place of an existing pump.

4.4. FACTOR s. NR 111.13(2)(a)4., Wis. Adm. Code: Remaining useful plant life.

See the previous discussion on this factor in the section for mechanical draft cooling towers above.

4.5. FACTOR s. NR 111.13(2)(a)5., Wis. Adm. Code: Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

A quantified and qualitative analysis of social costs and benefits was not done for this technology. VSPs are however relatively inexpensive when compared to previous options, so it can be estimated that the social costs of this technology will not significantly outweigh the social benefits provided by the use of this technology.

4.6. Summary/Conclusion

As discussed with mechanical draft cooling towers, entrainment reductions are directly proportional to flow reductions. Through this relationship it can be determined that VSPs would potentially reduce entrainment by allowing NDP to withdraw only the flow required at all times. However, anticipated flow reductions which could be attributed to VSPs are likely minimal, given that, when operating, NDP utilizes less than 50% of the DIF. The department has concluded that due to the factors listed in NR 111.13, Wis. Adm. Code, the use of one or more VSPs is not BTA for NDP.

10.5 OTHER TECHNOLOGIES: Aquatic Filter Barriers and Intake Relocation

NDP also evaluated the installation of aquatic filter barriers as they could prohibit the upstream and downstream movement of fish. However, debris loading, and net resilience are expected to be significant issues for use of filter barriers. Pilot installation of aquatic filter barriers have been unsuccessful. Furthermore, anticipated costs in installing these barriers is estimated to be greater than $4 million.

Intake relocation was evaluated, but these costs were determined to far outweigh any potential entrainment reductions. Also, three intakes are already located offshore.

11 Entrainment BTA Decision (Intakes 701, 702, 703, 704, and 705)

In determining the entrainment BTA for NDP mechanical draft cooling towers, fine mesh screens, water reuse, alternative sources of cooling water, and VSPs were evaluated. From these evaluations it was determined that the existing usage of the five intake structures, based on flow reductions and offshore location in two cases, is considered BTA to achieve the maximum reduction in entrainment at NDP based on the factors specified in s. NR 111.13. Various factors went into rejecting the other evaluated technologies as BTA for NDP.

Mechanical draft cooling towers were rejected as an option for NDP due to the lack of a perceived benefit in terms of flow reductions (and subsequent entrainment reductions) compared to the extreme costs of retrofitting a closed-circuit cooling water system as well as the increase in emissions of particulates and other pollutants.

Fine mesh screens were rejected as BTA primarily due to the costs significantly outweighing the benefits that would be provided through their use. The amount of water that could potentially be provided through internal reuse would provide a minimal reduction in flow and thus a minimal reduction in entrainment. Due to this the social costs are anticipated to be significantly greater than the social benefits that this technology would generate which lead the department to reject water reuse as BTA to achieve the maximum reduction in entrainment at NDP. VSPs were rejected based on the expected minimal flow reductions.

12 Summary

1. The department has made a Best Technology Available (BTA) determination for five cooling water intake structures (CWIS – 701, 702, 703, 704, and 705) located at the Biron Mill (NDP) in accordance with ch. NR 111, Wis. Adm. Code. The department has concluded that none of these existing intakes are BTA for minimizing impingement mortality.
2. The permittee proposes to comply with a BTA impingement standard in s. NR 111.12(1)(a)2., Wis. Adm. Code. Therefore, a compliance schedule will go into the reissued permit allowing the permittee time to meet a BTA standard for impingement at all five intake structures.
3. After consideration of the factors listed in s. NR 111.13, Wis. Adm. Code, the department has concluded that the existing five CWIS are considered the best technology available to achieve the maximum reduction in entrainment.
4. BTA determinations will be reviewed at the next reissuance and at subsequent reissuances in accordance with ch. NR 111, Wis. Adm. Code. In subsequent permit reissuance applications, the permittee shall provide all the information required in s. NR 111.4(2)(b), Wis. Adm. Code unless a request to reduce the information required has been submitted by the permittee and accepted by the department, as allowed by s. NR 111.42(1)(a).
5. The BTA includes requirements for monitoring and inspection of the CWIS and other requirements and terms; please see the permit for those requirements.

APPENDIX B-2

FULL BTA DETERMINATION:
WI RAPIDS MILL COOLING WATER INTAKE STRUCTURES

Author:
Nate Willis, P.E.
Wastewater Engineer
Bureau of Water Quality

Date:
12/06/2024

1 Executive Summary

In conformity with Section 316(b) of the Clean Water Act, the location, design, construction, and capacity of cooling water intake structures should reflect the best technology available (BTA) for minimizing adverse environmental impacts. The department has made a Best Technology Available (BTA) determination for five cooling water intake structures (CWIS) formerly utilized by PCR Rapids One Operations LLC's (PCR Rapids) Wisconsin Rapids Mill (WRM) in accordance with ch. NR 111, Wis. Adm. Code.

Paper machine 12 in the Wisconsin Rapids Mill is owned and operated by Sonoco Products, as are the North and South intake structures. The BTA for the CWIS is based on the required information submitted for a facility that withdraws greater than 2 MGD Design Intake Flow (DIF) and uses at least 25% of the total water withdrawn for cooling purposes. WRM is considered an existing facility for purposes of the rule because construction of the facility commenced prior to January 17, 2002 (s. NR 111.02(3)(a), Wis. Adm. Code). The department has concluded that existing impingement mortality reduction measures at all five of WRM's intakes do not meet the standards for best technologies available for minimizing adverse environmental impact.

None of the CWIS meet one of the impingement mortality standards in s. NR 111.12, Wis. Adm. Code, so a compliance schedule is proposed in the draft permit to allow the permittee time to modify the existing intake structures to meet one of the impingement mortality standards in accordance with s. NR 111.11(3)(a), Wis. Adm. Code.

The department must establish BTA standards for entrainment reduction for the intake on a site-specific basis (s. NR 111.13, Wis. Adm. Code). "These standards shall reflect the department's determination of the maximum reduction in entrainment warranted after consideration of the relevant factors as specified in subs. (2) and (3)." (s. NR 111.13, Wis. Adm. Code). After consideration of the factors specified in s. NR 111.13(2) and (3), Wis. Adm. Code, the department has concluded that all intakes are considered the best technology available to achieve the maximum reduction in entrainment.

The BTA determination will be reviewed at the next permit reissuance and at subsequent reissuances in accordance with ch. NR 111, Wis. Adm. Code, as applicable. In subsequent permit reissuance applications, the permittee shall provide all the information required in s. NR 111.40(2)(b), Wis. Adm. Code, unless a request to reduce the information required has been submitted by the permittee and accepted by the department, as allowed by s. NR 111.42(1)(a), Wis. Adm. Code.

Intake 710, which is an emergency intake, is considered BTA based on infrequency of use.

2 Background Information

WRM is situated on the western shore of the Wisconsin River in downtown Wisconsin Rapids, Wisconsin. The mill was designed to withdraw water from the Wisconsin River through six different intake structures from an impoundment created by a dam that was constructed as part of the mill in the 1950s. Two of the intakes are used solely for process water and one intake (#710 – WRM Condenser, out of commission since 2004) is permanently closed off and not used. The combined design intake flow (DIF) from the five active CWIS is 123.8 million gallons per day (MGD). Since August 2020, WRM has been shut down, with ND Paper's Biron Mill and Sonoco Products both sending process wastewater to the Water Quality Center along with discharging cooling water under its WPDES permit. This BTA determination assumes that WRM is operating at full capacity, and thus actual intake flow information from the five years prior to the shutdown is deemed to be representative of operating conditions.

Two intakes -#711 and #712- are being transferred from being owned by Billerud to Sonoco Products, which operates an active machine within the Wisconsin Rapids Mill. In 2024, Billerud sold the WRM to PCR Rapids One Operations LLC (PCR Rapids). This BTA determination addresses Sonoco's two intake structures (711 and 712), along with the (currently idled) three PCR Rapids intake structures.

3 Intake Structures Descriptions

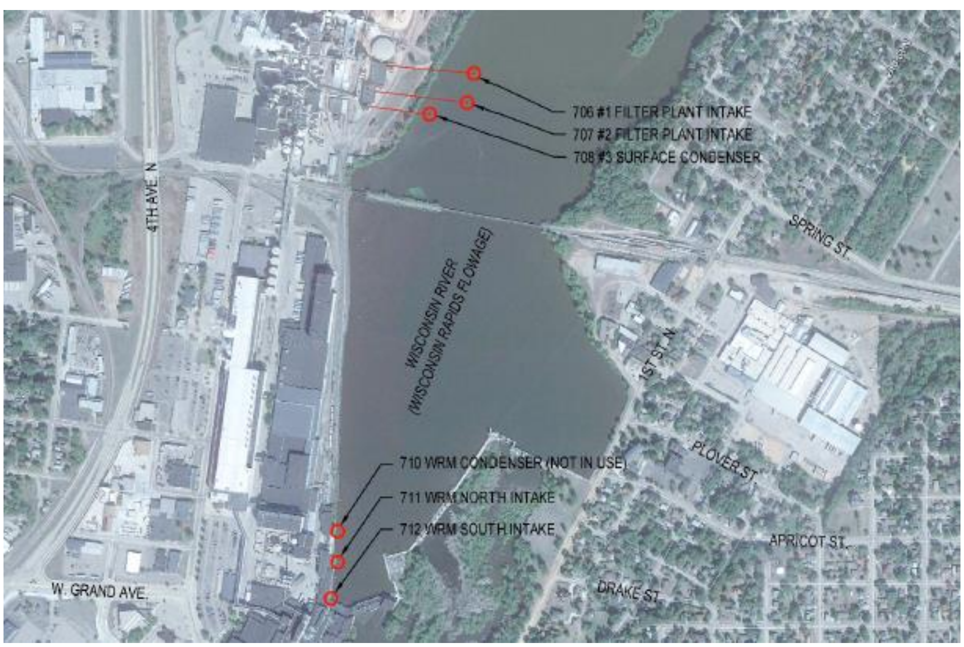
Each of the intake structures at WRM is located offshore in the main stem of the river, or beneath the water surface along the wall of the dam. None of the intakes employs a standard traveling screen system such as those typically used at power plants. Coordinates for each of the WRM intakes can be found in Table 1 below. For a map showing the approximate locations, see Figure 1.

Intake 710 is an emergency intake structure that has not been used outside of fire suppression tests.

Table 6 - Coordinates of Each Intake

Intake Name	Latitude	Longitude
706 (#1 Filter Plant) – PCR Rapids	44.4044°N	89.8214°W
707 (#2 Filter Plant) – PCR Rapids	44.4042°N	89.8217°W
708 (#3 Surface Condenser) - PCR Rapids	44.4039°N	89.8222°W
711 North Intake – Sonoco	44.3958°N	89.8247°W
712 South Intake - Sonoco	44.3956°N	89.8247°W

Figure 2 - Map of Intake Locations



3.1 #1 Filter Plant Intake (706) – PCR Rapids

Intake 706 consists of a concrete structure located approximately 250 feet offshore from the west bank of the Wisconsin River and 1,100 yards upstream of the Wisconsin Rapids Dam. The intake structure is 7 feet wide on each side and 5 feet high. The intake delivers water to the #1 Filter Plant through a 42-inch diameter concrete pipe which is approximately 4.5 feet below the water surface. Three sides of the CWIS are covered by steel plate screens perforated with ½-inch diameter holes, 2 1/8-inch on center. The top of the CWIS is covered by 3/16-inch grating. Inside the mill, water passes through two rotary water filter screens with 150 x 150 (150 openings per 1”) mesh stainless steel screens prior to the pumps. Water that passes through the screens is pumped by five river water (7,000 gpm) pumps and one SMI (1,000 gpm) pump with total aggregate capacity of 25,785 gpm (37.13MGD). The 37 MGD design capacity is calculated using the pipeline capacity rather than pump capacities, as was determined by measuring maximum flow with all pumps operating. Approximately 11.5% of the water pumped through this CWIS is used exclusively for cooling purposes. Heated effluent from the 60 lb Kraft Mill Steam Condenser (supplied by Intake 708) is diverted to the pump sump of Intake 706 which allows the use of heated water to backflush Intake 706 screens during winter months, also providing pre-heated water for filter plant use at those times.

3.2 #2 Filter Plant Intake (707) – PCR Rapids

Intake 707 consists of a concrete structure located approximately 147 feet offshore from the west bank of the Wisconsin River and 1,000 yards upstream of the Wisconsin Rapids Dam. The intake structure is approximately 7 feet wide on each side and 5 feet high. The intake delivers water to the #2 Filter Plant through a 36-inch diameter concrete pipe which is approximately 4.5 feet below the water surface. Three sides of the CWIS are covered by steel plate screens perforated with 1 ½-inch diameter holes, 2 1/8-inch on center. The top of the CWIS is covered by 3/16-inch grating. Water that passes through the screens is pumped by three river water pumps with total aggregate capacity of 22,200 gpm (31.97 MGD) (two 7,500 gpm clarifier feed pumps, one 7,200 gpm river water pump). One 4,000 gpm pump, which serves as a spare, and one 1,500 gpm emergency fire pump are not counted toward DIF. Approximately 8.7% of the water pumped through this CWIS is used exclusively for cooling purposes.

3.3 #3 Surface Condenser Intake (708) – PCR Rapids

Intake 708 consists of a concrete structure located approximately 51 feet offshore from the west bank of the Wisconsin River and 992 yards upstream of the Wisconsin Rapids Dam. The intake structure is 8.2 feet wide, 8.6 feet long and 4.7 feet high. The intake conveys water to the mill through a 35-inch diameter concrete pipe which is approximately 4 1/4-feet below the water surface. Three sides and the top of the CWIS are covered by 19W4 (mesh size opening: 4” x 1 3/16”) carbon steel standard mesh grating. Water that passes through the CWIS is pumped by one steam condensate pump (1,000 gpm), one condenser cooling water pump (18,500 gpm) and one HBLOX vent condenser pump (3,500 gpm) for a total capacity of 23,000 gpm (33.1 MGD). All the water drawn through this CWIS is used exclusively for cooling purposes.

3.4 North Intake (711) – Sonoco Products Co.

The North Intake is located approximately 197 feet upstream of the Wisconsin Rapids Dam. The intake is a 24-inch diameter pipe opening on the west bank of the river. The intake pipe is 4.67 feet below water surface and approximately 16 feet off the bottom of river. This intake was installed prior to 1960 and new filter screens and pumps were installed in 1991.

The intake is fitted with a rectangular box with a bar screen on the river side that measures 2.83 feet by 7.8 feet. The bar rack consists of 3/8-inch bars, 1 ½ inches on center. The intake pipe joins a common header with the south intake and feeds a common header tank. Water flows by gravity through three parallel rotary screens into the pump sump. Each rotary screen measures 5 feet by 10 feet of 60 mesh (0.25mm opening) metal wire. Bypass water including aquatic organisms and debris that do not pass through the rotary screen mesh are returned to the river. Water that is not filtered and is rejected through the rotary filters does not pass through the pumps but passes back to the river so is not considered part of the DIF. Filtered water is drawn from the pump sump by three 5,000 gpm pumps. Water flows into the rotary filters and into the clear water sump by gravity and is withdrawn by the pumps, therefore DIF was calculated to be the combined capacity of the three pumps.

The combined DIF for the North and South intakes is 15,000 gpm (21.6 MGD). Approximately 65% of the water pumped though this CWIS is used exclusively for cooling purposes. Reject water and debris that does not pass through the filters for use in the mill is routed through two Hydra sieve screens with 3/8-inch mesh and then to the clear water sewer and back to the river, downstream of the dam through Outfall 015 via an 8-inch diameter pipe. Debris collected on the Hydrosieve screens is collected and disposed. Fish and ichthyoplankton that are not screened out by the Hydrosieves are passed to the clear water sewer and returned to the river. Impingement samples were collected from the Hydrosieve screens during the 2014 impingement characterization study, documenting the numbers of fish that entered the combined North and South intakes and rejected through the rotary screens.

3.5 South Intake (712) – Sonoco Products Co.

The South Intake structure consists of a 20-inch pipe located 167 feet upstream of the Wisconsin Rapids Dam on the west bank of the river. The intake pipe is 16.5 feet below water surface and approximately 4 feet off the bottom of river. There are no screens or bar racks on this intake as it is simply an open pipe. It joins a common header with the North intake and water passes through the same rotary screens described above. As with the North Intake, approximately 65% of the water pumped though this CWIS is used exclusively for cooling purposes.

3.6 Summary

The combined maximum design intake flow of all the WRM CWIS is 123.8 MGD. The annual water usage divided by the number of days in the year represents the average intake flow for that year. The 5-year running average of annual intake flows is the AIF as defined by the 316(b) rule. For the 4.5-year period from January 2016 through when the mill was shut down in July 2020, the AIF of the five WRM CWIS was 52 MGD, or approximately 42% of DIF of 123.8 MGD.

4 Application Materials Submitted

As part of the WPDES Permit Application, WRM was required to submit information required under ss. NR 111.41(1) through (7) and (13). WRM provided the information required under ss. NR 111.41(1) through (7) and (13). The relevant application materials were included in a report titled "*Clean Water Act 316(b) Compliance Submittal Requirements per 40 CFR 122.21(r)(2) through (8)*", dated May 2019, and produced by Environmental Consulting and Technology, Inc.

In accordance with s. NR 111.11(1)(a), WRM is subject to the best technology available (BTA) standards for impingement mortality reduction under s. NR 111.12 and entrainment mortality reduction under s. NR 111.13, including any measures to protect federally-listed threatened and endangered species and designated critical habitat established under s. NR 111.14(7). A discussion on the BTA standards for impingement mortality is provided first followed by entrainment.

5 BTA Standards for Impingement Mortality

In accordance with s. NR 111.12(1)(a), these intake structures must comply with one of the alternatives in sub.1. through 7. except as provided in sub. (b)1. or 2., when approved by the department. In addition, a facility may also be subject to the requirements of s. NR 111.12(2), Wis. Adm. Code, if the department requires such additional measures.

One option for compliance with the impingement mortality BTA standard is achieving 0.5 Feet per second maximum design intake velocity (s. NR 111.12(1)(a)2., Wis. Adm. Code). As the basis for the department's determination, the owner or operator of the facility shall demonstrate that the cooling water intake structure has a maximum design intake velocity less than or equal to 0.5 feet per second under all conditions. The owner or operator of the facility shall submit information to the department that demonstrates that the maximum design intake velocity does not exceed 0.5 feet per second.

5.1 Intake Velocity Calculation

The predicted approach velocities for the five intake structures were calculated by ECT, Inc. and presented in WRM's application materials, with updated flow information through when shutdown commenced in 2020 to supplement that data. The predicted maximum design intake velocity and actual intake velocity for WRM's various intakes are summarized in Table 1 below.

Table 7 - Summary of Intake Velocities

Intake Name	Pumps	DIF (MGD)	AIF (2016 – 7/2020, MGD)	Flow Area (ft2)	Design Intake Velocity (ft/s)	Actual Intake Velocity (ft/s)
706 (#1 Filter Plant)	5x 7,000 gpm 1x 1,000 gpm	37.13	21.9	66.85	**0.86**	0.50
707 (#2 Filter Plant)	2x 7,500 gpm	31.97	7.63	7.07***	**7.00**	1.67

	1x 7,200 gpm					
708 (#3 Surface Condenser)	1x 1,000 gpm 1x 18,500 gpm 1x 3,500 gpm	33.10	14.1**	6.68***	**7.66**	3.26
711 North Intake	3x 5,000 gpm	21.60*	4.2	2.2***	**15.3**	3.0
712 South Intake	3x 5,000 gpm	21.60*	4.2	2.2	**15.3**	3.0
Total Flows	**111,200 gpm**	**123.8***	**52**			

*Combined DIF for North and South intakes is 21.6 MGD, as the DIF does not include the river water rejected through the rotary filters and does not pass through the pumps.
**708 intake was in operation for all of 2020 while the WRM was being shut down.
***Flow area based on the cross-sectional area of the intake pipe for intakes with >0.56" openings despite having a screen over the pipe.

As part of the chosen option for compliance with the impingement mortality BTA standard, the 0.5 ft/s maximum design intake velocity must be met at all points between where water is withdrawn and the first mesh screen with openings of 0.56 inches or less (s. NR 111.03(26)., Wis. Adm. Code).

5.2 Collected Impingement Data

Impingement sampling was conducted by ECT at WRM from October 2012 through September 2013 on the North and South intakes (711 and 712). The dominant species impinged were channel catfish (64%) and emerald shiner (25%). The remaining eleven species at WRM accounted for 10% of the remaining fish, see Table 3 below for a summary of all impinged species.

Table 8 - 2012 - 2013 Impingement Sampling Results for WRM (Intakes 711 and 712)

Species	Number	% of Total
Channel catfish	1163	64.3
Emerald Shiner	458	25.3
Black crappie	27	1.5
White bass	76	4.2
Yellow bullhead	22	1.2
Bluegill	31	1.7
Yellow perch	17	0.9
Spottail shiner	6	0.3
Trout perch	1	0.1
Walleye	4	0.2
Lake Sturgeon	1	0.1
Brassy Minnow	1	0.1
Green sunfish	1	0.1
Total	**1808**	

6 Assessment of Achieving Design Intake Velocity <0.5 ft/s

6.1 Reduction in Flow (DIF)

WRM has assessed the possibility of reducing DIF at each of the intake systems and determined that there may be options available to reduce the maximum flow rates at one or more of the intakes. When the mill was running, average water use was significantly lower than full DIF because pumps were run only as needed. However, when all available (non-standby) pumps ran at the same time for a given intake, water was withdrawn at DIF. In order to reduce DIF, pump capacity would need to be reduced or some pumps placed in permanent standby mode. As part of the compliance process, WRM has proposed to investigate the potential to reduce flow at each intake and compare the feasibility and impacts of that option against increasing intake screen size described in the following paragraph. In order to achieve 0.5 ft/s velocity at Intakes 706 and 707, DIF would need to be reduced to below 21.6 MGD. Flow reduction has been determined by the facility to be infeasible at Intakes 711 and 712.

6.2 Increase Screen Area

WRM has studied the possibility of increasing cross-sectional area for flow as a means of reducing intake velocity. The proposed plan to achieve the 0.5 ft/s goal by increasing open screen area at each intake is described below.

6.2.1 Intakes 706 and 707

By expanding the size of the screen area of the intake structure, the intake velocity across the face of the screens can be reduced to 0.5 ft/s, thus meeting the IM BTA criteria. In order to meet the velocity standard, the open area of the screened sides of these two intakes would have to increase by at least 75% (Intake 706) and 50% (Intake 707). Under the status quo, Intake 707's openings are 1.5" and thus exceed the required 0.56" openings for measuring the velocity standard, this assessment assumes the appropriately sized mesh grating is installed.

The method envisioned to accomplish this is to increase the size of the intake structure by either replacing the existing screen structure with a larger one, or by installing a screen structure over and outside the existing structure. In either case, the installed screen would be of sufficient size, with sufficient percentage of open area to restrict intake velocity to <0.5 ft/s at DIF. WRM has assumed that the new structures would include screens with 3/8-inch, 14-gage wire mesh panels with 67% open area (per manufacturer's specifications). With these qualifications, Intake 706 would require 115 ft^2 of open area, or a structure of at least 172 ft^2 of screen, and Intake 707 would require 100 ft^2 of open area for a structure of 150 ft^2 of screen.

This option would involve obtaining permits for construction in a navigable waterway through the Corps of Engineers and will incur substantial capital costs. The structures will require the ability to backflush the intakes to remove debris and ice from the screens. The current backflush systems may not be sufficient to clean the new screens. This will need to be determined through detailed design, but the minimum open area of 115 ft^2 and 100 ft^2 would be specified for Intakes 706 and 707, respectively.

6.2.2 Intake 708

Intake 708 is currently covered by a grating with >0.56" openings, so in order to accurately measure the intake velocity, a mesh with <0.56" openings will be required to be installed either on top of or in place of the existing grating. This may result in an impingement velocity lower than 0.5 ft/s as the current velocity outlined in the Table above is measured in the concrete pipe and not at the screen itself.

6.2.3 Intakes 711 and 712

Intakes 711 and 712 are located on the face of the mill dam itself. Intake 711 has a bar rack screen with openings greater than 0.56", while intake 712 is a 20-inch open pipe. It's estimated that the velocity around these intake pipes drops to 0.5 ft/s when the cross-sectional area of flow is equal to 67 ft^2, assuming that each intake would be required to carry the full flow of the combined intakes if one is temporarily out of commission during maintenance. This equates to a steel cage with 3/8-inch, 14- gage wire mesh panels (67% open area, per manufacturer specifications) on three sides and the top of a 5-foot by 5-foot steel frame mounted on the side of the dam wall around the intake openings. The cages could be lifted out of the water for manual cleaning or plumbing installed to backflush in place. An alternative design could include combining the two intake openings into a common header on the river side of the dam wall that would contain the required screened area and feed both intakes. This configuration would not require two separate structures. This could reduce cost of the system. The exact configuration of the screened intakes would be determined through final design, but the open area of at least 67 ft^2 would be specified.

7 Chosen Compliance Option: BTA for Impingement Mortality

The department has determined that none of the intake structures meet the Impingement Mortality standards. WRM is required to comply with one of the standards by 03/31/2029. This may include modifications to Intakes 706, 707, 711 and 712 in order to reduce the intake velocities to below 0.5 ft/s through either flow reduction or installation of a new intake screening system at each of these intakes.

8 BTA Standards for Entrainment

The permittee proposes that the design and operation of the intakes meets the BTA standards for entrainment mortality reduction. The department has evaluated this proposal under s. NR 111.13 and recommends the approval of this proposal. Below is a written explanation of the proposed entrainment determination as required by s. NR 111.13(1).

For entrainment control, the regulations expressly call for the permitting agency to make a site-specific determination of which technologies and/or practices satisfy the BTA standard for each individual facility (s. NR 111.13, Wis. Adm. Code). The BTA "shall reflect the department's determination of the maximum reduction in entrainment warranted after consideration of the relevant factors as specified in subs. (2) and (3)." The regulations also give the department the discretion to reject an otherwise available technology as the BTA for entrainment if the social costs are not justified by the social benefits or if there are other unacceptable adverse factors that cannot be mitigated (s. NR 111.13(4)).

The proposed determination must be based on consideration of any additional information required by the department and the factors listed in s. NR 111.13(2)(a). The weight given to each factor is within the department's discretion based upon the circumstances of each facility. In addition, the proposed determination may be based on consideration of the factors listed in s. NR 111.13(3).

In accordance with s. NR 111.13(2), the following factors must be considered:

1. Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species, and designated critical habitat (e.g., prey base);
2. Impact of changes in particulate emissions or other pollutants associated with entrainment technologies;
3. Land availability inasmuch as it relates to the feasibility of entrainment technology;
4. Remaining useful plant life; and
5. Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

In accordance with s. NR 111.13(3), the following factors may be considered in determining a site-specific BTA:

1. Entrainment impacts on the waterbody;
2. Thermal discharge impacts;
3. Credit for reductions in flow associated with the retirement of units occurring within the ten years preceding October 14, 2014;
4. Impacts on the reliability of energy delivery within the immediate area;
5. Impacts on water consumption; and
6. Availability of process water, gray water, wastewater, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.

In the preamble to the 316(b) Rule (79 Fed. Reg. 48300 at 48303), USEPA indicated the following:

The entrainment provision reflects EPA's assessment that there is no single technology basis that is BTA for entrainment at existing facilities, but instead a number of factors that are best accounted for on a site-specific basis. Site-specific decision making may lead to a determination by the NPDES permitting authority that entrainment requirements should be based on variable speed pumps, water reuse, fine mesh screens, a closed-cycle recirculating system, or some combination of technologies that constitutes BTA for the individual site. The site-specific decision-making may also lead to no additional technologies being required.

Candidate entrainment control technologies are provided in s. NR 111.41(13), including a closed cycle recirculation system, fine mesh screens with a mesh size of 2 mm or smaller, and water reuse or alternate sources of cooling water, and variable speed pumps (i.e., variable frequency drive pumps).

9 Entrainment Performance Evaluation

9.1 Entrainment Characterization Data

Entrainment data used for evaluating WRM's intake structures was collected April through September 2018 at ND Paper LLC's Biron Mill (Intake #705), which is located approximately 10,000 feet upstream of the closest intake structure in use at WRM. A summary of the entrainment data collected at the Biron Boiler House can be found in Tables 4 and 5 below. Using the Biron intake entrainment densities, actual intake flows reported during the study and AIF as projected annual flow, annual entrainment estimates for WRM totaled 18.2 million ichthyoplankton, or approximately 1.5% of all entrainable organisms in this segment of the Wisconsin River. Overall, Cyprinidae sp., Cyprinidae type, Ictiobinae sp., and Burbot were the dominant taxa entrained in 2018, accounting for 45.5, 21.7, 9.3, and 9.1% of the annual estimated entrainment, respectively at the Biron Boiler House Intake.

A total of 4,779 ichthyoplankton were collected during the 2018 entrainment study representing eight families and 34 taxa, with a total density of 52.2 specimens per 100 cubic meters (#/100 m3). Cyprinidae was the most abundant family, accounting for nearly 70% of the total ichthyoplankton collected with a total density of 36.5/100 m^3. Within the Cyprinidae group, Cyprinidae sp. (40.5%), followed by Cyprinidae type (22%) were the most abundant taxa collected. Other dominant taxa included Ictiobinae sp., Lepomis sp., Burbot, and Common Carp, each accounting for 5.6 to 12.2% of the total ichthyoplankton with overall densities ranging from 2.0 to 6.4/100 m. Besides unidentified ichthyoplankton (2.6%), Emerald Shiner type (1.5%), and Pimephales type (1.3%), no other taxa accounted for more than 1% of the total composition. No federally listed or state listed threatened or endangered species were identified during the study.

Recreational taxa collected during the study included Common Carp, Burbot, all Catostomids (suckers), Ictalurids (catfishes), Moronidae (temperate basses), Centrarchids (sunfishes) and some Percids (Yellow Perch, Sauger, and Sander sp.). As a group, recreational species comprised approximately 30 percent of the total ichthyoplankton collected. The State of Wisconsin defines game fish as all varieties of fish except rough fish and "minnows" or bait fish. According to this definition, game fish comprised less than 8% of the total number of ichthyoplankton collected. Seasonal ichthyoplankton densities increased by mid-spring and peaked in the late spring/ early summer, and then declined in August. Ichthyoplankton were not collected in the September samples.

Table 9 - Summary of Entrainment Characterization Data Collected at nearby Biron Mill April - September 2018

Taxonomic Group	Taxa	Number	%	Density (#/100m3)
CYPRINIDAE (Carps and Minnows)	COMMON CARP	186	3.9	2.0
	SHINER type	7	<1	0.1
	EMERALD SHINER	8	<1	0.1
	EMERALD SHINER type	73	1.5	0.8
	SPOTTAIL SHINER type	4	<1	0.0
	MIMIC SHINER type	1	<1	0.0
	Notropis sp.	11	<1	0.1
	Pimephales type	62	1.3	0.7
	Pimephales sp.	3	<1	0.0
	CYPRINIDAE type	1,052	22	11.5

Taxonomic Group	Taxa	Number	%	Density (#/100m3)
	CYPRINIDAE sp.	1,935	40.5	21.1
CATOSTOMIDAE (Suckers)	Moxostoma sp.	1	<1	0.0
	CATOSTOMINAE sp.	1	<1	0.0
	ICTIOBINAE sp.	583	12.2	6.4
ICTALURIDAE (Catfishes)	YELLOW BULLHEAD	2	<1	0.0
	CHANNEL CATFISH	1	<1	0.0
PERCOPSIDAE (Trout-Perches)	TROUT-PERCH	3	<1	0.0
GADIDAE (Codfishes)	BURBOT	266	5.6	2.9
MORONIDAE (Temperate Basses)	WHITE BASS	3	<1	0.0
	YELLOW BASS	1	<1	0.0
	Morone sp.	16	<1	0.2
CENTRACHIDAE (Sunfishes)	BLUEGILL	27	0.6	0.3
	Lepomis sp.	332	6.9	3.6
	Pomoxis sp.	1	<1	0.0
PERCIDAE (Perches)	Etheostoma type	10	<1	0.1
	BANDED DARTER type	4	<1	0.0
	Etheostoma sp.	1	<1	0.0
	YELLOW PERCH	6	<1	0.1
	Catonotus type	1	<1	0.0
	Percina type	24	0.5	0.3
	SAUGER	1	<1	0.0
	Sander sp.	6	<1	0.1
	LOGPERCH type	17	<1	0.2
	DARTER sp.	4	<1	0.0
UNIDENTIFIED		126	2.6	1.4
Total		**4,779**	**100**	**52.2**

Table 10 - Annual Entrainment Estimates at WRM (based on DIF)

Extrapolation Period	Biron Mill Intake 705	WRM (All Intakes)
APR 1-30	867,403	1,397,721
MAY 1-15	76,083	178,829
MAY 16-31	1,371,781	3,224,325
JUN 1-15	2,568,582	4,099,016
JUN 16-30	1,914,051	3,054,497
JUL 1-15	803,676	1,557,386
JUL 16-31	822,563	1,593,986
AUG 1-31	1,522,514	3,092,603
SEP 1-30	0	0
Total	**9,946,653**	**18,198,363**

9.2 Current Entrainment Control Measures

The primary reduction mechanism for entrainment at WRM are through: variable speed pumps (VSPs), reduction of actual intake flow compared to DIF (AIF is 42% of DIF when Mill is operating) and location of three of the intakes offshore in the main river stem away from commonly used shoreline habitat and where there are strong sweeping velocities (Intakes 706, 707, and 708). Another consideration is that the facility also withdrawals a very small percentage of the mean annual river flow (1.3%). The following sections summarize current measures for each specific intake.

9.2.1 Intake 706

When in operation, winter flows are reduced due to 60lb Condenser. AIF is 59% of DIF. VSPs. Offshore intake location.

9.2.2 Intake 707

AIF is 24% of DIF. VSPs. Offshore intake location.

9.2.3 Intake 708

AIF is 43% of DIF. VSPs. Offshore intake location.

9.2.4 Intakes 711 and 712

AIF is 19% of DIF. VSPs. Unfiltered river water passes through the system over the Hydrosieve screens and back through the river through Outfall 015 downstream of the dam.

10 Evaluation of Other Candidate Entrainment Control Technologies

The department has further evaluated the other remaining candidate entrainment control technologies in order to make the BTA determination. Below is an evaluation of the candidate technology:

10.1 TECHNOLOGY: Mechanical Draft Cooling Towers (closed-cycle recirculating system)

10.1.1. FACTOR s. NR 111.13(2)(a)1., Wis. Adm. Code: Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base).

A closed cycle recirculating system (CCRS) would potentially reduce entrainment. This is because entrainment reductions are directly proportional to flow reductions. As discussed in the 316(b) Rule Preamble, mechanical draft cooling towers operating in freshwater sources can achieve flow reductions of 97.5 percent (based on a cycle of concentration of 3.0). 79 Fed. Reg. 48300 at 48338. Therefore, USEPA estimates that freshwater cooling towers, compared to once-through cooling systems, reduce impingement mortality and entrainment by 97.5 percent.[2] However, the only flow which would be reduced would be cooling water flows and not process wastewater flows, so the actual reductions would be much less (33%).

Mechanical draft cooling towers (MDCT) are large facilities often associated with power generating stations. These structures use large flows of water through the towers along with a mechanical fan to create differential pressure between the tower interior and exterior, inducing a draft through the tower, and exhausting at the top the tower as a warm vapor plume. These systems require a large footprint, a significant amount of energy, and a large cooling water flow to operate. MDCTs can be in a rectilinear arrangement or in a circular arrangement. MDCTs can achieve the heat loss for WRM and can be considered a potential technology to decrease entrainment.

10.1.2. FACTOR s. NR 111.13(2)(a)2., Wis. Adm. Code: Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

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[2] USEPA. Technical Development Document for the Final Section 316(b) Existing Facilities Rule. EPA-821-R-14-002. May 2014.

Installation of mechanical draft cooling towers would result in increased air emissions, and a new emission source. While any tower would likely utilize plume abatement technology, the towers would produce visibility reduction due to fogging, ice formation on surfaces downwind from the cells, and visual pollution as perceived by receptors adjacent to WRM.

It is expected that the parasitic load created by the addition of the tower fans and pump station would cause an energy penalty that would be replaced by a nearby fossil fuel burning facility, which would lead to an increase in gas combustion emissions.

Energy would also need be replaced by nearby fossil fuel burning facilities during the process of retrofitting WRM for a CCRS.

10.1.3. FACTOR s. NR 111.13(2)(a)3., Wis. Adm. Code: Land availability inasmuch as it relates to the feasibility of entrainment technology.

The availability of space for infrastructure was considered in the assessment of entrainment BTA. Due to the location being centrally located in downtown Wisconsin Rapids, the footprint of the facility is too small to allow the installation of a MDCT.

10.1.4. FACTOR s. NR 111.13(2)(a)4., Wis. Adm. Code: Remaining useful plant life.

The WRM has been idled since mid-2020. With that stated, this BTA determination assumes that the WRM will have several years of operational viability if production were to resume at the facility.

10.1.5. FACTOR s. NR 111.13(2)(a)5., Wis. Adm. Code: Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

WRM has estimated the cost to retrofit the existing facility with cooling towers would be $10.3 million (as of date of report – May 2018). The facility believes the potential reduction in existing entrainment rates (1.5% of entrainable organisms) does not outweigh the significant costs that would be incurred.

10.1.6. FACTOR s. NR 111.13(3)(a), Wis. Adm. Code: Entrainment impacts on the waterbody.

It is unlikely that reducing entrainment by 97.5% would have a large impact on the ecosystem surrounding the intake structure. Furthermore, closed cycle cooling would impact only about 33% of total mill intake flow (approx. 30 MGD) compared to mean annual river flow of 3,134 MGD.

10.1.7. FACTOR s. NR 111.13(3)(b), Wis. Adm. Code: Thermal discharge impacts.

Cooling towers would decrease thermal impacts in limited areas around outfalls, but have little effect on river overall based on the thermal discharge relative to river flow.

10.1.8 Summary/Conclusion

Mechanical Draft Cooling Tower would potentially reduce entrainment due to decreased flows, but for only 33% of the water withdrawn from the river. Other unacceptable adverse factors that cannot be mitigated make this technology unavailable at WRM. Factors contribute to making this technology infeasible, including:

1. Increase in particulate emissions (which would likely require a minor source air permit),
2. Increased energy usage,
3. Increased chemical usage
4. Net social costs outweigh social benefits.

For these reasons, the department has rejected additional mechanical draft cooling towers/closed cycle cooling as an option.

10.2 TECHNOLOGY: Fine Mesh Screens

10.2.1. FACTOR s. NR 111.13(2)(a)1., Wis. Adm. Code: Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base).

Fine mesh screens would potentially reduce entrainment by physically preventing the passage of eggs and larvae further into the plant. This is because the openings in a fine mesh screen are smaller than many fish eggs and larvae. Fine mesh screens, however, would just exclude entrainable organisms without reducing their mortality, so there would be limited to no environmental benefit. Entrainment reduction percentages through the use of fine mesh screens vary widely from facility to facility but in the alternative analysis that was submitted with WRM's permit reissuance application WRM simply notes that the existing entrainment numbers are not having a significant effect on the receiving waterbody.

10.2.2. FACTOR s. NR 111.13(2)(a)2., Wis. Adm. Code: Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

Installation of fine mesh screens are not anticipated to have an effect on the particulate emissions from WRM.

10.2.3. FACTOR s. NR 111.13(2)(a)3., Wis. Adm. Code: Land availability inasmuch as it relates to the feasibility of entrainment technology.

Land availability is not typically a concern for the use of fine mesh screens since they are installed in the source waterbody.

10.2.4. FACTOR s. NR 111.13(2)(a)4., Wis. Adm. Code: Remaining useful plant life.

See the previous discussion on this factor in the section for mechanical draft cooling towers above.

10.2.5. FACTOR s. NR 111.13(2)(a)5., Wis. Adm. Code: Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

Installation of new fine mesh screen systems would require combining intakes which are widely separated. Cost of retrofitting or installing new fine mesh screens, estimated to be approximately $3.9 million. Operation of FMS would also result in increased clogging.

10.2.6. Summary/Conclusion

Fine mesh screens would potentially reduce entrainment by physical exclusion of anything larger than the slot size of the mesh, but those organisms would likely still experience mortality on the screens. Primarily due to the social costs of this technology significantly outweighing the social benefits the department has rejected the use of fine mesh screens at WRM as BTA.

10.3 TECHNOLOGY: Water Reuse or Alternative Sources of Cooling Water

10.3.1. FACTOR s. NR 111.13(2)(a)1., Wis. Adm. Code: Numbers and types of organisms entrained, including, specifically, the numbers and species (or lowest taxonomic classification possible) of Federally-listed, threatened and endangered species and designated critical habitat (e.g., prey base).

Water reuse and alternative sources of cooling water may potentially reduce entrainment by reducing the intake flow from the source water. As discussed with mechanical draft cooling towers reductions in entrainment are directly proportional to flow reductions. The entrainment reductions from water reuse or an alternative source of cooling water vary based how much of the cooling water required by the facility can be provided through reuse or an alternative source. The facility has not indicated how much NCCW could be reused as process wastewater.

10.3.2. FACTOR s. NR 111.13(2)(a)2., Wis. Adm. Code: Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

WRM does not anticipate that particulate emissions would be affected by utilizing an alternative source or re-using NCCW or process wastewater.

10.3.3. FACTOR s. NR 111.13(2)(a)3., Wis. Adm. Code: Land availability inasmuch as it relates to the feasibility of entrainment technology.

Many of the systems served by CWISs are inside existing mill buildings. Installing new piping systems or modifying existing infrastructure would potentially cause extensive disruption of existing equipment and structures. Similarly, conveying water to the site would involve new pipelines.

10.3.4. FACTOR s. NR 111.13(2)(a)4., Wis. Adm. Code: Remaining useful plant life.

See the previous discussion on this factor in the section for mechanical draft cooling towers above.

10.3.5. FACTOR s. NR 111.13(2)(a)5., Wis. Adm. Code: Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.

No nearby water source is available. Some water re-use is already done for ice control. WRM anticipates that the cost involved with re-plumbing existing systems and conveying water to the mill greatly exceeds the expected potential benefit. Nearest POTW (gray water) or potable water sources do not have sufficient capacity to supply the mill.

10.3.6. Summary/Conclusion

Water reuse and alternative sources of cooling water may reduce entrainment due to the reduction in the required intake flow. Though the facility has indicated that it's infeasible to reuse wastewater as NCCW, the facility has not made a demonstration as to the feasibility of reusing NCCW as process wastewater. Because of this, the department has determined that implementing water reuse at WRM would potentially be BTA for reducing entrainment mortality.

10.4 Other Technologies: Aquatic Filter Barriers and Intake Relocation

WRM also evaluated the installation of aquatic filter barriers as they could prohibit the upstream and downstream movement of fish. However, debris loading, and net resilience are expected to be significant issues for use of filter barriers. Pilot installation of aquatic filter barriers have been
unsuccessful. Furthermore, anticipated costs in installing these barriers is estimated to be greater than $5 million.

Intake relocation was evaluated, but these costs were determined to far outweigh any potential entrainment reductions. Also, three intakes are already located offshore.

11 Entrainment BTA Decision

In determining the entrainment BTA for WRM mechanical draft cooling towers, fine mesh screens, water reuse, and alternative sources of cooling water were evaluated. From these evaluations it was determined that the existing usage of intake structures 706, 707, and 708, based on flow reductions, VSPs, and offshore locations, is considered BTA to achieve the maximum reduction in entrainment at WRM based on the factors specified in s. NR 111.13. Various factors went into rejecting the other evaluated technologies as BTA for WRM. For intake structures 711 and 712, the department has determined that these are considered BTA because of the usage of VSPs.

Mechanical draft cooling towers were rejected as an option for WRM due to the lack of a perceived benefit in terms of flow reductions (and subsequent entrainment reductions) compared to the extreme costs of retrofitting a closed-circuit cooling water system as well as the increase in emissions of particulates and other pollutants.

Fine mesh screens were rejected as BTA primarily due to the costs significantly outweighing the benefits that would be provided through their use. The amount of water that could potentially be provided through internal reuse would provide a minimal reduction in flow and thus a minimal reduction in entrainment. Due to this the social costs are anticipated to be significantly greater than the social benefits that this technology would generate which lead the department to reject water reuse as BTA to achieve the maximum reduction in entrainment at WRM.

12 Summary

1. The department has made a Best Technology Available (BTA) determination for five cooling water intake structure (CWIS) located at the Wisconsin Rapids Mill (WRM – currently idled) in accordance with ch. NR 111, Wis. Adm. Code. The department has concluded all of the existing CWISs are not BTA for minimizing impingement mortality.
2. The permittee proposes to comply with a BTA impingement standard in s. NR 111.12(1)(a)2., Wis. Adm. Code. Therefore, a compliance schedule will go into the reissued permit allowing the permittees time to meet a BTA standard for impingement at the other four intake structures. If the permittee decides to upgrade these intake structures to comply with the 0.5 ft/s impingement mortality standard, then it will be required to

comply with that standard under all operating conditions. This compliance schedule will be conditioned on WRM resuming normal operations.

3. After consideration of the factors listed in s. NR 111.13, Wis. Adm. Code, the department has concluded that all five of the existing CWIS are considered the best technology available to achieve the maximum reduction in entrainment.
4. BTA determinations will be reviewed at the next reissuance and at subsequent reissuances in accordance with ch. NR 111, Wis. Adm. Code. In subsequent permit reissuance applications, the permittee shall provide all the information required in s. NR 111.4(2)(b), Wis. Adm. Code unless a request to reduce the information required has been submitted by the permittee and accepted by the department, as allowed by s. NR 111.42(1)(a).
5. The BTA includes requirements for monitoring and inspection of the CWIS and other requirements and terms; please see the permit for those requirements.

APPENDIX C

Technology-Based Effluent Limit (TBEL) Memo

The current permit's technology-based effluent limits (TBELs) were derived based on 1979 production numbers. These limits were more stringent than the 2010 calculations that were done, so they were included in the 2010 permit reissuance in lieu of the re-calculated numbers which were based on 2007, 2008, and 2009 production numbers. Since the 15 years since the permit was last reissued, there have been several significant process changes, including the idling of the WRFE, the WRM (save for the Sonoco BM 12 machine), and changes in the products produced at the Biron Mill.

Sonoco Products in Wisconsin Rapids reported an average value of 280 TPD for BM 12.

The following changes were recently made at the Biron Mill:

- Thermomechanical Pulping operations were shut down in March 2023. This supplied virgin mechanical fiber for coated groundwood paper production. This is anticipated to be a permanent shutdown.
- PM 26 stopped producing coated groundwood paper in March 2023 and started (4/3/23) making all containerboard products only (recycled pulp fiber supply). These limits below are derived from these updated processes.
- 1400T old corrugated container (OCC) plant supplying recycled fiber (based on primary OCC but also some mixed paper) officially started operation on April 3, 2023.
- 700T OCC plant shut down on March 31, 2024. This is considered an indefinite market related shutdown.
- PM 25 shutdown on March 31, 2024. This is considered an indefinite market related shutdown.
- PM 25 and the 700T OCC plant are anticipated to restart in the latter half of 2025. Neither the timing or the final decision to restart at all have been finalized yet.

Biron Mill Production (air-dried short tons per day)		
Year	**PM 25**	**PM 26**
2023	551	532
2024	123	717
Capacity	770	1162

In considering what production numbers to use to calculate the technology-based effluent limitations, the definition of 'Production' contained within 40 CFR 430.01(n)(1) includes, "Production shall be determined for each mill based upon past production practices, present trends, or committed growth." Typically, department practice has been to look at annual production data and either average the numbers or choose the highest annual production number from the past permit term. In this case, because production information for the last two years under the new equipment is inconsistent, the operations have significantly been altered at the Biron Mill, and effluent limitations are dropping already due to the closing of the WRM and WRFE, the department has determined that production information for the purposes of calculating technology-based effluent limits should be based on the PM 25 and PM 26 production capacities (770 TPD and 1,162 TPD, respectively). The department is still utilizing the 280 TPD number for the Sonoco paper machine in these calculations as those production trends and products have been more consistent than those at the Biron Mill.

For the next reissuance in 2030, the department will again reevaluate the production trends from the upcoming permit term and decide as to what numbers to use. The permittee is notified that BOD5 and TSS effluent limitations may become more stringent based on this future reevaluation.

BPT and NSPS Effluent Limits from 40 CFR Part 430 and ch. NR 284, Wis. Adm. Code.

Subcategory	BOD5 (lbs BOD5 per ton of production)		TSS (lbs TSS per ton of production)	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum
BPT Paperboard FWP (PM 25 – Corrugated)	5.6	11.4	9.2	18.4
NSPS Paperboard FWP (PM 26 - Corrugated)	4.2	7.8	4.6	8.8
BPT Paperboard FWP (Sonoco BM 12 – Noncorrugated)	3.0	6.0	5.0	10.0

ND Paper LLC – Biron Mill

BPT Paperboard FWP (PM 25 – Corrugated):

- 5.6 lbs BOD5/T x 770 TPD = 4,312 lbs BOD5/day
- 11.4 lbs BOD5/T x 770 TPD = 8,778 lbs BOD5/day
- 9.2 lbs TSS/T x 770 TPD = 7,084 lbs TSS/day
- 18.4 lbs TSS/T x 770 TPD = 14,168 lbs TSS/day

NSPS Paperboard FWP (PM 26 – Corrugated):

- 4.2 lbs BOD5/T x 1,162 TPD = 4,880 lbs BOD5/day
- 7.8 lbs BOD5/T x 1,162 TPD = 9,064 lbs BOD5/day
- 4.6 lbs TSS/T x 1,162 TPD = 5,345 lbs TSS/day
- 8.8 lbs TSS/T x 1,162 TPD = 10,226 lbs TSS/day

Sonoco Products Co. – Wisconsin Rapids:

BPT Paperboard FWP - Noncorrugated:

- 3.0 lbs BOD5/T x 280 TPD = 840 lbs BOD5/day
- 6.0 lbs BOD5/T x 280 TPD = 1,680 lbs BOD5/day
- 5.0 lbs TSS/T x 280 TPD = 1,400 lbs TSS/day
- 10.0 lbs TSS/T x 280 TPD = 2,800 lbs TSS/day

Calculations:

Total BOD5 Monthly Average Calculations:

PM 25: 4,312 lbs BOD5/day
PM 26: 4,880 lbs BOD5/day
BM 12: 840 lbs BOD5/day
10,032 lbs BOD5/day

Total BOD5 Daily Maximum Calculations:

PM 25: 8,778 lbs BOD5/day
PM 26: 9,064 lbs BOD5/day
BM 12: 1,680 lbs BOD5/day
19,522 lbs BOD5/day

Total TSS Monthly Average Calculations:

PM 25: 7,084 lbs TSS/day
PM 26: 5,345 lbs TSS /day
BM 12: 1,400 lbs TSS /day
13,829 lbs TSS/day

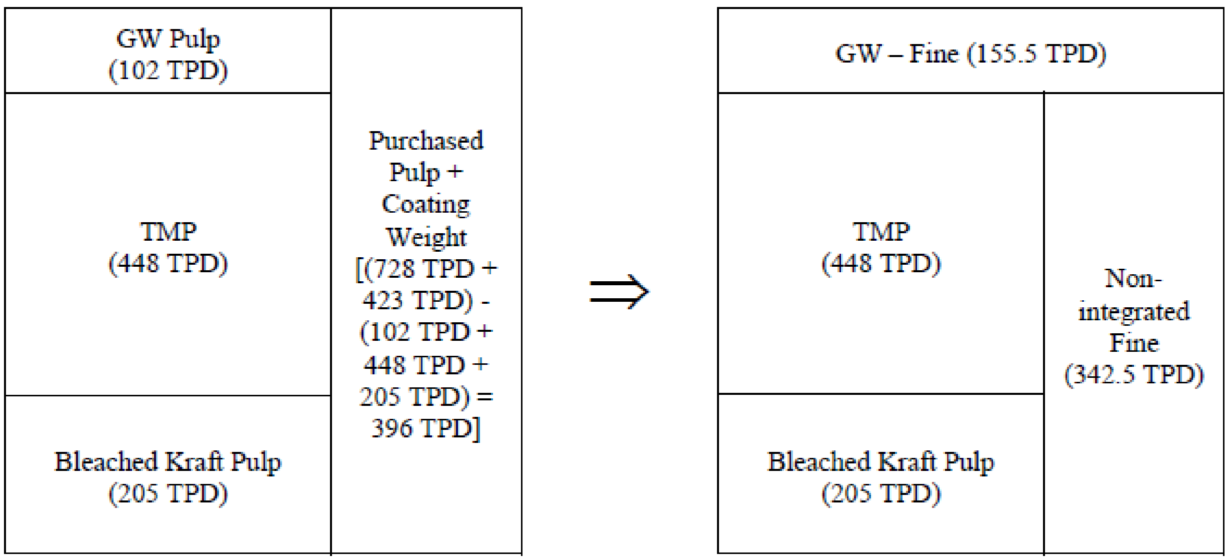
Total TSS Daily Maximum Calculations:

PM 25: 14,168 lbs TSS/day
PM 26: 10,226 lbs TSS /day
BM 12: 2,800 lbs TSS /day
27,194 lbs TSS/day

The following table shows the difference in the proposed effluent limitations and the previous reissuance's effluent limitations for BOD5 and TSS:

Parameter	-07 Reissuance	-08 Reissuance	Percent Change
BOD5 (Daily Max)	32,792 lbs/day	19,522 lbs/day	-40%
BOD5 (Monthly Avg)	17,083 lbs/day	10,032 lbs/day	-41%
TSS (Daily Max)	55,689 lbs/day	27,194 lbs/day	-51%
TSS (Monthly Avg)	29,916 lbs/day	13,829 lbs/day	-54%

2010 Production Calculations (for reference, based on 2007, 2008, or 2009 production, note that it excludes production data from WRFE and the WRM):



Groundwood pulp productions = 102 TPD

Thermo-mechanical pulp production = 448 TPD

Bleached Kraft Pulp = 205 TPD (considered by the Department to be integrated production since papermaking wastewaters are recycled from the Biron mill back to Wisconsin Rapids Fiber and Energy.)

Purchased pulp and coating weight = Total paper production minus on-site pulp production =

(728 TPD + 423 TPD) Total Paper - (102 TPD GW + 448 TPD TMP + 205 TPD) = 396 TPD

Fraction of total pulp production attributable to groundwood pulp =

102 TPD GW/(102 TPD GW + 448 TPD TMP + 205 TPD) = 0.135

Purchased pulp and coating weight assigned to the Groundwood - Fine subcategory =

396 TPD x 0.135 = 53.5 TPD

Total paper production assigned to the Groundwood - Fine Subcategory =

102 TPD GW + 53.5 TPD = 155.5 TPD

Total paper production assigned to the TMP subcategory = 448 TPD (remains unchanged)

Total paper production assigned to Bleached Kraft Pulp subcategory = 205 TPD (remains unchanged)

Total paper production assigned to the Nonintegrated Fine subcategory =

(728 TPD + 423 TPD) TPD Total Paper - (155.5 TPD GW + 448 TPD TMP + 205 TPD BK) = 342.5 TPD

Also note that PM 26 is a “new source” since it was constructed after 1/3/83 (s. NR 284.03 (19)). New Source Performance Standards (NSPS) are applied to the machine's production of 728 TPD (e.g., 728 TPD ÷ (728 TPD + 423 TPD) = 0.63), and Best Practicable Treatment (BPT) standards are applied to the remaining paper production (1 – 0.63 = 0.37).

NSPS Groundwood Fine: 0.63 x 3.8 lbs BOD5/T x 155.5 TPD = 372.3 lbs BOD5/day
NSPS Groundwood TMP: 0.63 x 5.0 lbs BOD5/T x 448 TPD = 1,411.2 lbs BOD5/day
NSPS Fine Bleached Kraft: 0.63 x 6.2 lbs BOD5/T x 205 TPD = 800.7 lbs BOD5/day
NSPS Nonintegrated Fine: 0.63 x 3.8 lbs BOD5/T x 342.5 TPD = 819.9 lbs BOD5/day
BPT Groundwood Fine: 0.37 x 7.2 lbs BOD5/T x 155.5 TPD = 414.3 lbs BOD5/day
BPT Groundwood TMP: 0.37 x 11.1 lbs BOD5/T x 448 TPD = 1,839.9 lbs BOD5/day
BPT Fine Bleached Kraft: 0.37 x 11.0 lbs BOD5/T x 205 TPD = 834.4 lbs BOD5/day
BPT Nonintegrated Fine: 0.37 x 8.5 lbs BOD5/T x 342.5 TPD = 1,077.2 lbs BOD5/day

Total Monthly Average for Biron Mill = 7,569.9 lbs BOD5/day

APPENDIX D

Water Quality-Based Effluent Limit (WQBEL) Memo