Permit Fact Sheet

General Information

Permit Number	WI-0067318-01-0
Permittee Name and Address	SONOCO PRODUCTS CO 1 North Second Street Hartsville SC 29550
Permitted Facility Name and Address	SONOCO PRODUCTS WISCONSIN RAPIDS 310 3rd Ave N Wisconsin Rapids WI 54495
Permit Term	July 01, 2025 to June 30, 2030
Discharge Location	015: 44.394585° N, 89.82412° W
Receiving Water	Wisconsin River of Wisconsin River (upper) in Wood County
Stream Flow ($Q_{7,10}$)	999 cfs
Stream Classification	Warm Water Sport Fishery
Discharge Type	Existing, Continuous

Facility Description

The Wisconsin Rapids Mill (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. Since August 2020, WRM has been shut down except for Sonoco's BM 12 paper machine, with ND Paper's Biron Mill and Sonoco Products both sending process wastewater to the Water Quality Center (WQC), ND Paper also discharges cooling waters under the WQC's WPDES permit.

Sonoco Products Wisconsin Rapids ('Sonoco') submitted a permit application to discharge vacuum pump seal water under its own WPDES permit under existing Outfall 015. This permit is also created to move the North and South intake structures and Outfall 015 to Sonoco's individual WPDES permit. Process wastewaters from BM12 are still sent to be treated at the WQC.

Substantial Compliance Determination

Enforcement During Last Permit: No formal enforcement action was taken against Sonoco Products during the previous permit term.

After a desk top review of all discharge monitoring reports, compliance schedule items, and a site visit on 10/10/2023, this facility has been found to be in substantial compliance with their current permit.

Compliance determination made by Logan Rubeck, Wastewater Engineer on 1/24/2025.

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)**
711	4.2 MGD (1/2016 – 7/2020)	Sampling Point 711 represents the Wisconsin Rapids Paper Mill North Intake.
712	4.2 MGD (1/2016 – 7/2020)	Sampling Point 712 represents the Wisconsin Rapids Paper Mill South Intake.
015		Sampling Point 015, cooling waters (from BM 12), noncontact cooling waters (condensing steam turbine and other sources) and storm water, if present, shall be monitored after mixing, but prior to discharge to the Wisconsin River via Outfall 015.

Changes from Previous Permit:

This is a first-time issuance of this permit. However, this discharge was previously covered with the same sampling points under WPDES Permit No. WI-0037991-07-1 (now ND Paper LLC – WQC, Permit No. WI-0037991-08-0).

The 'In-Plant' sampling point section was removed as Sampling Point 129, which was used to assess stock carryover from BM 12, has been determined to not be necessary and all sampling of vacuum pump seal water from BM-12 has been moved to Outfall 015.

Permit Requirements

1 Influent – Water Intake Structure (WIS) – Monitoring

1.1 Sample Point Number: 711- WRM NORTH INTAKE and 712- WRM SOUTH 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 Cooling		% Flow	Annual	Calculated	

Changes from Previous Permit

Flow rate monitoring and an annual requirement to calculate the previous years' percentage of water used exclusively for cooling are now included.

Explanation of Limits and Monitoring Requirements

Daily monitoring of influent flow rate and an annual requirement to calculate the percentage of water used exclusively for cooling are included to ensure that this intake structure is categorized appropriately for the purposes of ensuring compliance with federal 316(b) requirements.

Water Intake Structure (WIS)- The Influent section includes the WIS description, authorization for use, and BTA (Best Technology Available) determination. See Appendix B for more information. The permittee is authorized to use the cooling water intake structure which consists of the following:

- Location:
    - 711: 44.3958°N, 89.8247°W
    - 712: 44.3956°N, 89.8247°W
- Source Waterbody Information:
    - $Q_{7,10}$: 999 cubic feet per second
- General Description:
    - 711: 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 pipe joins a common header with the south intake and feeds a common header tank. 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.
    - 712: 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.
- Major Components:
    - Intake 711 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 (which is simply a 20” pipe) 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 metal wire. Bypass water including aquatic organisms and debris that do not pass through the rotary screen mesh are returned to the river via Outfall 015.
- Maximum Design Intake Flow (DIF): The maximum design intake flow (DIF) is 21.6 MGD which is equivalent to 3.3% of the Q7,10. This is based upon both intakes’ three-pump capacity, not counting redundant or emergency pumps.
- Maximum Design Intake Velocity: 15.3 ft/s

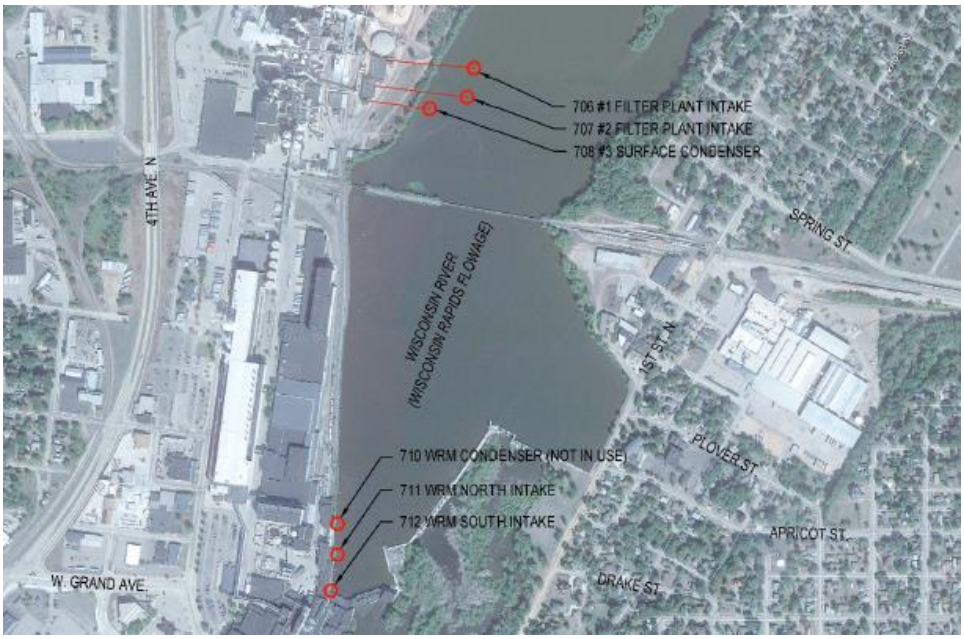
$$V_{711/712} = \frac{Q}{A * P} = \frac{21{,}600{,}000\,\frac{gal}{day} * \frac{1\,ft^3}{7.48\,gal} * \frac{1\,day}{86{,}400\,sec}}{\pi * (\frac{\frac{20\,inches}{2}}{\frac{12\,inches}{1\,ft}})^2} = 15.3\,ft/s$$

- Actual Intake Flow: 4.2 MGD

- Actual Intake Velocity: 3.0 ft/s

$$V_{711/712} = \frac{Q}{A * P} = \frac{4{,}200{,}000\,\frac{gal}{day} * \frac{1\,ft^3}{7.48\,gal} * \frac{1\,day}{86{,}400\,sec}}{\pi * (\frac{\frac{20\,inches}{2}}{\frac{12\,inches}{1\,ft}})^2} = 3.0\,ft/s$$

- Percent Used for Cooling: 65%
- Nearby Intakes:
    - 706 (#1 Filter Plant Intake – Idled since 7/2020): 44.4044°N, 89.8214°W
    - 707 (#2 Filter Plant Intake – Idled since 7/2020): 44.4042°N, 89.8217°W
    - 708 (#3 Surface Condenser – Idled since 2021): 44.4039°N, 89.8222°W



Intake Screen Discharges and Removed Substances- Floating debris and accumulated trash collected on the water intake trash rack shall be removed and disposed of in a manner to prevent any pollutant from the material from entering the waters of the State pursuant to s. NR 205.07 (3) (a), Wis. Adm. Code.

Endangered Species Act- This permit does not authorize take of threatened or endangered species. Contact the state Natural Heritage Inventory (NHI) staff with inquiries regarding incidental take of state-listed threatened and endangered species and the US Fish and Wildlife Service with inquiries regarding incidental take of federally-listed threatened and endangered species.

2 Surface Water - Monitoring and Limitations

2.1 Sample Point Number: 015- BM 12 VPSW + NCCW

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
Temperature Maximum	Daily Max	120 deg F	Daily	Continuous	
Chlorine, Total Residual	Daily Max	38 ug/L	Monthly	Grab	
Chlorine, Total Residual	Monthly Avg	38 ug/L	Monthly	Grab	
Copper, Total Recoverable	Daily Max	18 ug/L	Monthly	Grab	
Copper, Total Recoverable	Monthly Avg	18 ug/L	Monthly	Grab	
Copper, Total Recoverable	Daily Max	0.87 lbs/day	Monthly	Grab	
Hardness, Total as CaCO3		mg/L	Monthly	Grab	
Acute WET		TUa	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.

List changes below

- 'Sample Type' and 'Sample Frequency' for Flow Rate and Temperature were increased from 'Weekly' to 'Daily' and from 'Estimated'/ 'Grab' to 'Continuous' because the permittee uses a continuous flow meter and a continuous temperature probe to gather data.
- Temperature is now required to be reported as the maximum temperature recorded for that day.
- There is now a monthly average limit equal to 38 ug/L for Chlorine.
- The daily maximum limit for Copper has been reduced from 29 ug/L to 18 ug/L.
- There is now a monthly average limit for Copper.
- Monthly monitoring for Hardness 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 (See Appendix C).

3 Schedules

3.1 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.	12/31/2029
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.	

3.2 Cooling Water Intake Structures - Upgrades (Intakes 711 and 712)

Required Action	Due Date
Report on Intake Structure: Submit a report on the location, design, operation and capacity of the existing intake structures (Sampling Points 711 and 712).	06/30/2026
Action Plan: Submit for department concurrence a plan describing actions needed to achieve BTA (Best Technology Available) requirements.	06/30/2027
Status Update: The permittee shall submit a report documenting the status of compliance with federal and state BTA requirements.	06/30/2028
Complete Actions: Complete actions necessary to achieve compliance with the BTA requirements.	06/30/2029

3.3 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.	12/31/2029

Explanation of Schedule

The department has made the determination that these intakes do not represent the Best Technology Available for reducing entrainment and impingement mortality. Therefore, the permittee is required to comply with federal and state intake structure requirements in accordance with ch. NR 111, Wis. Adm. Code and section 316(b) of the Clean Water Act.

The department has included a reminder to submit a complete permit application by the Due Date to ensure that this permit is able to be administratively continued if the permit becomes backlogged.

Permit Expiration Date:

Appendix A – eDMR Data 2020 – 2024

Appendix B – Intake BTA Determination for Wisconsin Rapids Mill

Appendix C – WQBEL Memo

Permit Expiration Date:

06/30/2030

Prepared By:

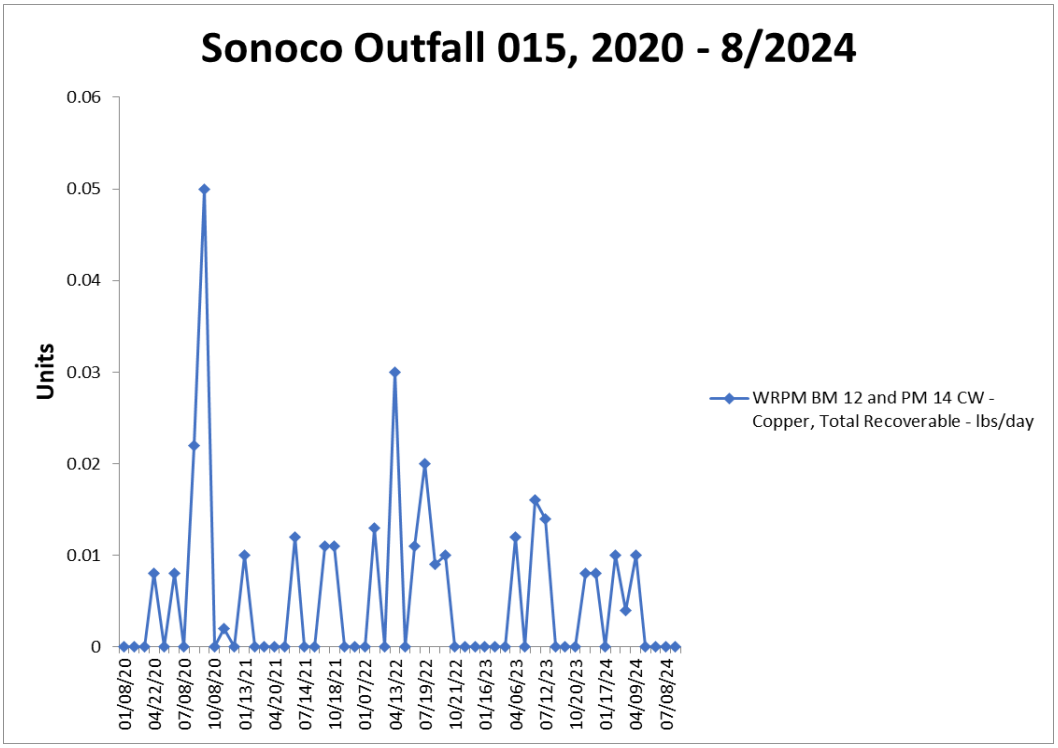
Nate Willis, P.E.
Wastewater Engineer
Bureau of Water Quality

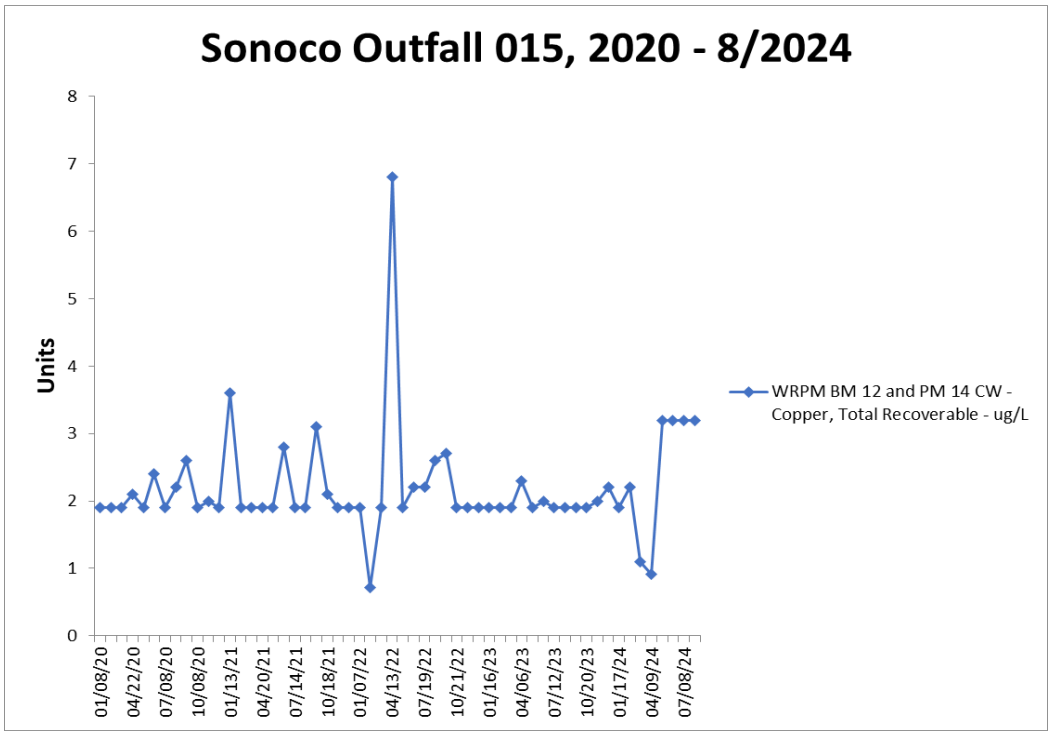
Date: 02/27/2025

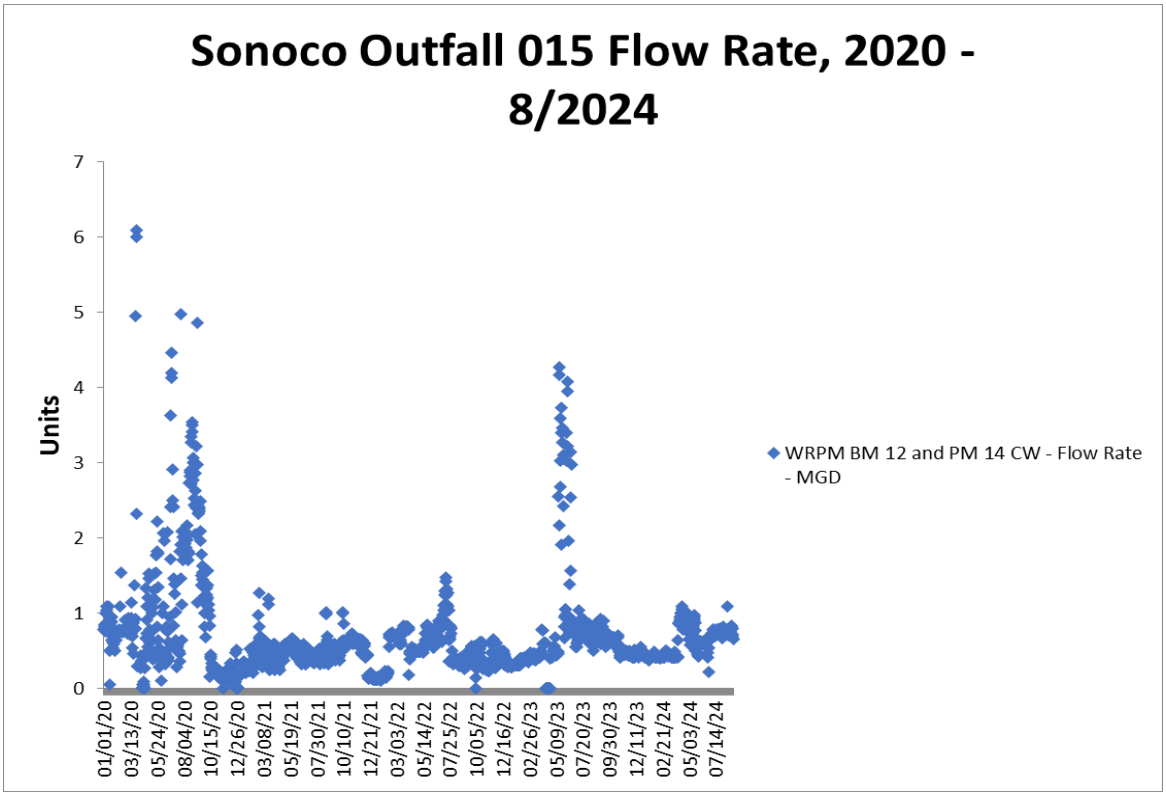
APPENDIX A

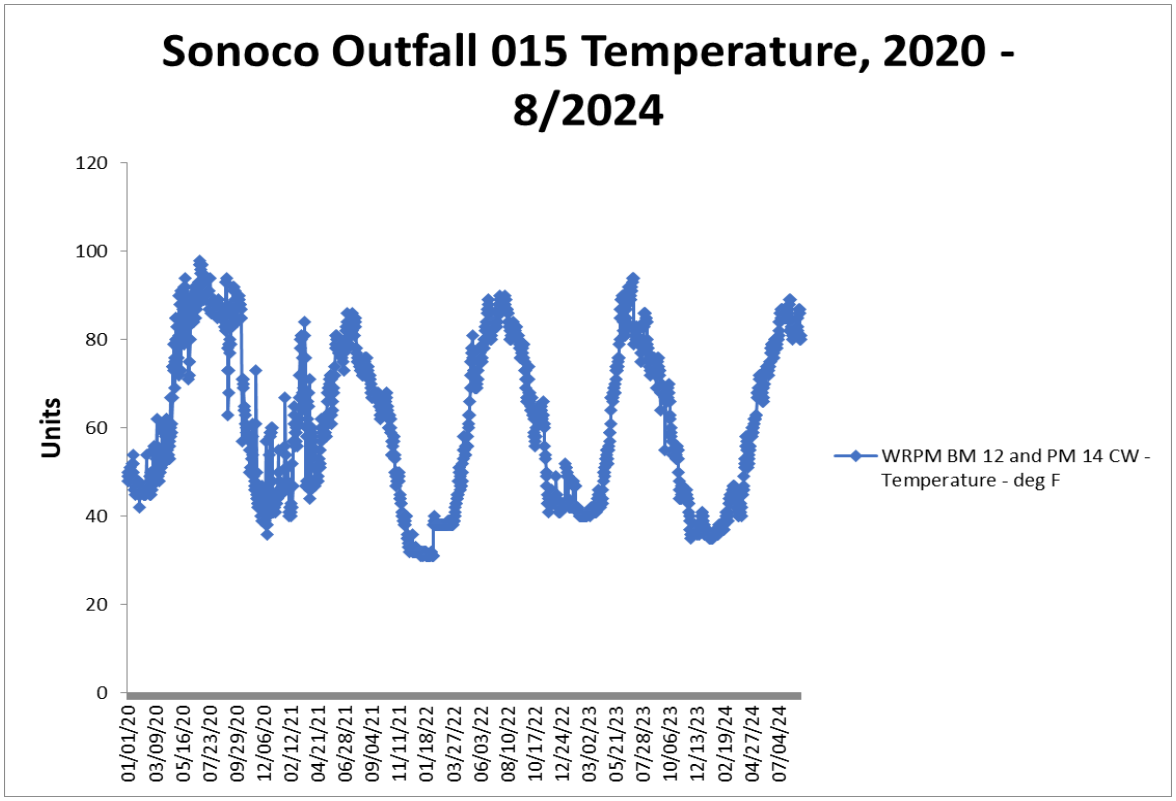
EDMR DATA, 2020 - 2024

015:






Sonoco Outfall 015 Flow Rate, 2020 - 8/2024
Units
0
1
2
3
4
5
6
7
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
09/30/23
12/11/23
02/21/24
05/03/24
07/14/24
WRPM BM 12 and PM 14 CW - Flow Rate - MGD


Sonoco Outfall 015 Temperature, 2020 - 8/2024
Units
0
20
40
60
80
100
120
01/01/20
03/09/20
05/16/20
07/23/20
09/29/20
12/06/20
02/12/21
04/21/21
06/28/21
09/04/21
11/11/21
01/18/22
03/27/22
06/03/22
08/10/22
10/17/22
12/24/22
03/02/23
05/21/23
07/28/23
10/06/23
12/13/23
02/19/24
04/27/24
07/04/24
WRPM BM 12 and PM 14 CW - Temperature - deg F

APPENDIX B

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

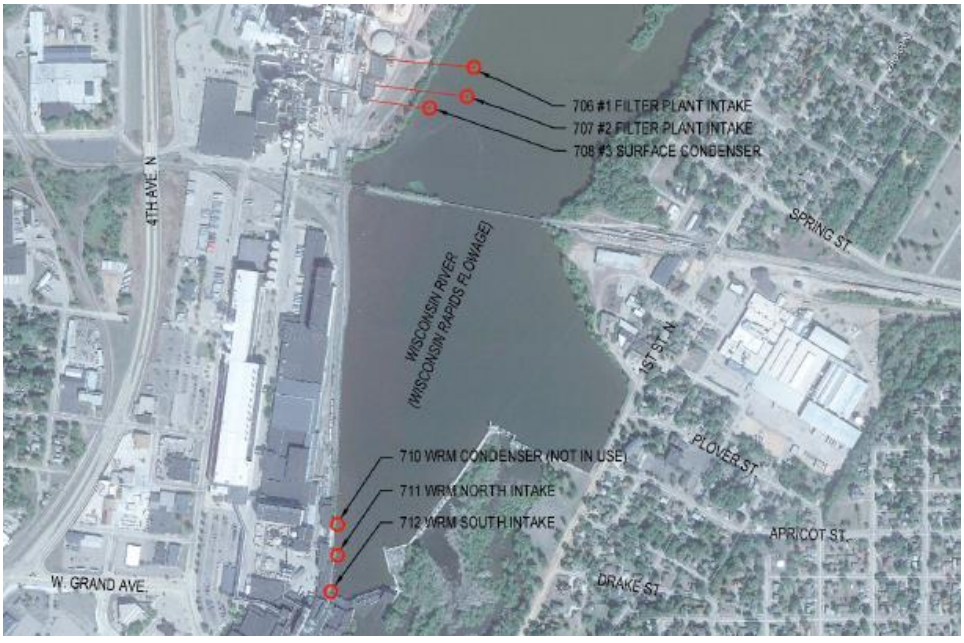
Each of the intake structures at WRM is located offshore in the main stem of the river, or beneath the water surface along the wall of the dam. None of the intakes employs a standard traveling screen system such as those typically used at power plants. Coordinates for each of the WRM intakes can be found 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 1 - 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 1 - 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 2 - 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 1x 7,200 gpm	31.97	7.63	7.07***	**7.00**	1.67
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 3 - 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 4 - 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
	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

Taxonomic Group	Taxa	Number	%	Density (#/100m3)
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 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)

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 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.

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 WRM.

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

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.

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.

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.

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.

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.

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.

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

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.

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.

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.

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 $3.9 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, 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

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.

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.

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.

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. 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.

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.

10.5 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.

Another option the permittee did not evaluate is the separation of Intakes 711 and 712 from Outfall 015. The permittee has not made a demonstration that the entrained organisms discharged through Outfall 015 are able to survive commingling with the cooling water.

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 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 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

WATER QUALITY-BASED EFFLUENT LIMITATION MEMO (SEE OUTFALL 015 PORTIONS)