Permit Fact Sheet

General Information

Permit Number:	WI-0003204-10-0
Permittee Name:	Dunn Paper - Ladysmith, LLC (formally Cellu Tissue – City Forest, LLC dba Clearwater Paper – Ladysmith)
Address:	1215 East Worden Ave
City/State/Zip:	Ladysmith WI 54848
Discharge Location:	Outfall 001, located ¼ mile SE of the Flambeau River Dam in Ladysmith, WI, on the west bank. Latitude 45.4621, Longitude 91.0806
Intake Location:	Along the Ladysmith dam, 45.463960 latitude, 91.084224 longitude
Receiving Water:	Flambeau River in the Lower Flambeau River Watershed (UC07) in the Upper Chippewa River Basin.
StreamFlow ($Q_{7,10}$):	409 cfs
Stream Classification:	Warm water sport fish community. Non- Public water supply.

Facility Description

Dunn Paper is a paper manufacturing plant in Ladysmith, WI that produces tissue products from recycled paper fibers. The mill is a De-Ink facility that produces an annual average of 175 tons per day (TPD) of tissue products as well as 30 TPD of wet lap paper to be used as furnish for Dunn Paper and other mills. The mill consists of a river water intake structure, intake water clarifier, two paper machines, a wastewater treatment plant (WWTP), and sludge handling equipment.

Dunn Paper's paper fiber recovery process consists of repulping post-consumer wastepaper, mill broke, and coated book stock bundles into a slurry. The paper slurry is then processed with centrifugal cleaners, screens, and dissolved air flotation (DAF) units to separate and remove contaminants. The repulping and cleaning steps are followed by a reduction step to further eliminate dyes and brighten the pulp for the paper machines. The process produces a commodity grade tissue or specialty napkin product. Dunn Paper's paper making process sends noncontact cooling water, process wastewater, and boiler blowdown year round to the WWTP. The mill is investigating the potential for making some changes to improve water reclamation inside the mill. If this occurs, it is possible that effluent discharge will be reduced.

The facility applied for an alternative technology-based phosphorus limitation, however after further review and discussion, the facility and the department have agreed that it is not appropriate at this time as both parties agree that the facility is likely able to meet the rolling 12-month average when the limit becomes effective 12 months into the permit.

Substantial Compliance Determination

Enforcement During Last Permit: January 31, 2022 the facility received a Notice of Noncompliance for a daily maximum violation of effluent BOD limitation.

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on July 12, 2023, this facility has been found to be in substantial compliance with their current permit.

Sample Point Designation

Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)
701	Intake an average of 1.1 MGD of surface water from the Flambeau River	Sample point for untreated Flambeau River water taken into the paper mill to be used as non-contact cooling water and process water.
001	An average of 0.98 MGD with a Maximum daily flow of 1.71 MGD on 06/18/2018 and a maximum annual average of 1.08 MGD in 2018	Process water is coarse-screened, then sent to primary settling clarifier. Primary effluent is further treated in two (1.0 million gallon and 0.5 million gallon) aeration basins. The mill wastewater is nutrient-deficient, so nitrogen and phosphorus are added to sustain biological treatment. The 0.5 million gallon basin has fine bubble diffusers and the 1.0 million gallon basin has surface aeration for both mixing and supplying dissolved oxygen. Primary and secondary solids are combined with the mill rejects in a blend tank that is then dewatered on a gravity belt thickener, followed by a belt filter press. Dewatered filtrate is returned to the primary influent wet well. Effluent is sampled using a Tru-test liquid sampler at a point following final clarification but before discharge to the Flambeau River. Flow is monitored by a Parshall flume with ultrasonic readings.
002	25,060 tons (dry weight basis) per year of sludge. Application frequency is 275 days per year.	The dewatered mixture of dissolved air flotation deink sludge, wastewater treatment plant primary and secondary sludge for land application/spreading on Department approved sites. waste is sampled off of the gravity belt press discharge. Waste is hauled by Russ Thompson Excavating Inc. The permittee has been applying to DATCP approved sites.
102	NA	Sample point for reporting results of analysis of the field blank sample collected at the same time as the treated wastewater effluent sample.

1 Influent – Cooling Water Intake Structure - Proposed Monitoring

Sample Point Number: 701- Flambeau River Intake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Annual	Calculated	
Intake Water Used Exclusively For Cooling		% Flow	Annual	Calculated	
Mercury, Total Recoverable		ng/L	Quarterly	Grab	

Changes from Previous Permit

None

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

- **Location:** The river water intake is located on the south side face of the Ladysmith dam (opposite the spillway) operated by XCEL Energy on the Flambeau River near the City of Ladysmith at approximately: 45.463960 latitude, 91.084224 longitude.
- **Source Waterbody Information:**

  7Q10 = 409cfs
- **General Description:** The current intake structure and system is estimated to have been installed in 1984 in coordination with the poser company using the Best Technology Available (BTA) at the time for a small intake on a large river at the dam face. Flambeau River water first passes through a bar screen with 1/4" wide vertical bars and 1.5" spacing. The screen width is 2.5', with a total length of 13.6". The actual working surface area of intake is dependent on river height. Debris and litter found on the bar screen is removed and disposed of daily by the facility. The river water flows through the bar screen into a 14" steel pipe through the dam structure into the mill where is it directed to the intake wet well (5' x 6' x 20') used for pumping to the water treatment system. The intake pipe is directed to overflow over a passive fixed fine bar screen which covers the entire top of wet well structure. The fine screen covering the wet well is a 100 mesh (0.149 mm). The screen allows for additional fine solids removal prior to draining into the wet well for treatment and facility use. The screen also provides passive flow through for anything which may pass through the course grates. Excess intake water also flows through a smaller overflow side channel adjacent to the wet well screen channel. Overflow water from the screen and side channel combines into a common discharge channel/outfall pipe for return to the river on the downstream side of the dam. The average intake overflow (river return) volume is 0.7 MGD. Intake water is used as non-contact cooling water and process water. None of the intake water is used for exclusively for cooling. Approximately 7% of the treated intake water is initially used for cooling then directed to process use.

  From the wet well the river water is then pumped and processed by the facilities Krofta water treatment system. The wet well pump is set to a maximum pumpage rate of 1.6 MGD (maximum capacity 2 MGD). Actual annual average daily pumpage is 1.1 MGD as metered through the pump and treatment unit. The water intake flow is dependent on the river level and hydraulic head, and is not dependent on wet well pumpage rates.

  Note: The intake flows and velocities of this system are unique. The flow and velocity through the trash rack is based on the hydraulic head of the river and is unaffected by the pump rates. The water flows by hydraulic head through the intake pipe and flows on top of a horizontal fine mesh screen that allows water to pass through it by gravity into the wetwell that the pumps are located in. Because of the water flowing over and falling through the fine mesh screen, all material is washed off of the screen and into the return bay and pipe, including fish and debris. The facility reports that the fine mesh screen has never needed to be cleaned off due to the screen size and scouring velocity of the water that flows over it which does not fall through the mesh.
- **Design and actual velocity and flow through the fine mesh screen:** The department is unable to calculate the velocity and flow through the horizontal screen due to the water flowing from a higher elevation to a lower elevation due to the force of gravity. The water does not flow due to energy provided by a pump. The design and actual velocity through the fine mesh screen is not necessary for the BTA determination for this intake structure. Any fish that come into contact with the horizontal screen will, by gravity, fall into the surrounding standing water and be sluiced back to the waterbody.
- **Maximum Design Intake Flow (DIF):** The maximum design intake flow would occur at high flow, flood stage condition with increased hydraulic head. At this condition the effective screen area would be 27.2 square feet with a

flow of 2.0 MGD (3.09 cfs), which is equivalent to 0.76 % of the $Q_{7,10}$. This is based upon the intake's pump capacity, not counting redundant or emergency pumps and is the pump rate in the wetwell.

- **Actual Design Intake Flow:** The actual design intake flow (DIF) is 1.6 MGD (2.97 cfs), which is equivalent to 0.726 % of the $Q_{7,10}$. This is based upon the what the pumps are set to pump at in the wetwell.
- **Actual Intake Flow:** The actual total intake flow under typical condition is 1.6 MGD (2.97 cfs). Actual intake flow used by the mill is 1.1 MGD (1.70 cfs) which is equivalent to 0.41% of the $Q_{7,10}$ (409 cfs) as measured through the water treatment system.
- **Maximum Design Intake Velocity:** The maximum design intake velocity would occur during low flow conditions. Although the hydraulic head would be decreased, the decreased effective screen area would also be decreased but with greater effect with an increased velocity of 0.36 fps at the trash rack in the river. The design intake velocity is 0.38 feet/second.
- **Actual Intake Velocity:** Actual Intake Velocity: The actual intake velocity is 0.16 feet/second and is determined by normal operating level of the dam, water elevation 1114.5 feet. 0.16ft/sec at the trash rack during 7Q10 flow depths.
- **Percent Used Exclusively for Cooling:** 0 percent used exclusively for cooling. All withdrawn water is used in production post cooling. The amount of water that enters the structure but does not flow into the pump well is unknown and based solely on the depth of water in the river.
- **Percent of intake water used compared to river flow is less than 5% of the mean annual flow:** Under normal operating conditions of the dam, total water intake is estimated 1.6 MGD with 1.1 MGD of the total used by the mill. The remaining volume is immediately returned to the river.
    - Annual Average flow rate = 1400 cfs: Intake to total flow is 0.2% and used process flow is 0.12% of river flow.
    - At a low flow condition of 7Q10 = 409 cfs: Intake to total flow is 0.7% and used process flow is 0.41% of river flow.
    - River harmonic mean flow rate = 908 cfs: Intake to total flow is 0.3% and used process flow is 0.187% of river flow.

Through screen velocity and flow calculations:

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Raw Water Inlet Screen Velocity Calculation (Low River)

6/19/2015

Assume:

Inlet Flow Dependent on River Level Regardless of Krofta Flow
Head Between Weir and River Level and Cv Determine Inlet Flow
Min. River Level is 5.75' Lower Than Nominal Level of 1114.5' Above Sea Level

Inlet Screen Surface Area

13.6' High x 2.5' Wide
Grating Consists of 24 (count) 1/4" wide steel bars
River Level Minimum 1' from Top Of Screen
Therefore:

Screen Height	13.6	ft
River Level from Scrn Top	11.4	ft
Screen Width	2.5	ft
Screen Grating Width	0.50	ft
Effective Screen Area	4.4	ft²

Flow From Inlet to Weir

Head = 2.08 ft = 0.9 psi
Therefore
Graph Factor (Fg) = 1.2

Cv (from Nominal condition calc)= 620.1

Flow= Cv*Fg = 744.113 gpm = 1.66 ft³/sec

Inlet Velocity = Inlet Flow (ft³/sec)/Effective Screen Area (ft²)

= **0.38 ft/sec**

Comments

Extremely unlikely occurrence if the river were run this low

Absolute minimum level the river could be run while maintaining adequate flow for Clearwater Paper to operate nominally.

This condition would be considered the Maximum Inlet Screen Velocity condition.

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Raw Water Inlet Screen Velocity Calculation (Nominal)

6/19/2015

Assume:

Inlet Flow = Bypass Flow + Krofta Flow
Krofta Flow = 740 gpm = 1.65 ft³/sec

Inlet Screen Surface Area
13.6' High x 2.5' Wide
Grating Consists of 24 (count) 1/4" wide steel bars
River Level Nominally 5' from Top Of Screen (1114.5' Above Sea Level)
Therefore:

Screen Height	13.6	ft
River Level from Scrn Top	5	ft
Screen Width	2.5	ft
Screen Grating Width	0.50	ft
Effective Screen Area	17.2	ft²

Bypass Weir Flow
Bypass Weir Flow = East Weir Flow + West Weir Flow
East Weir
Width 6 feet
Flow Depth 1.5 inches

West Weir
Width 4 feet
Flow Depth 0.75 inches

Assume Flow, Q, = 3.33 (L-0.2H)H$^{1.5}$
Therefore:

East Weir Flow	0.9	ft³/sec			
West Weir Flow	0.2	ft³/sec			
Total Weir Flow	1.1	ft³/sec	or	488	gpm

Raw Water Inlet Screen Velocity = (Bypass Flow + Krofta Flow)/Effective Screen Area

= **0.159 ft/sec**

Cv of Piping Between Raw Water Inlet Screen and Weir Calculation
River Elevation (Nominal) 1114.5 ft
Weir Water Level Elevation 1106.7 ft
Graph Factor (Fg) 1.98
Cv= (Total Weir Flow + Krofta Flow) / Graph Factor
where flows are in gpm
Therefore
Cv = 620.1

Explanation of Limits and Monitoring Requirements

Monitoring for flow rate and intake water used exclusively for cooling: Monitoring flow rate and percent used exclusively for cooling is required to determine applicability with section 316(b) of the Clean Water Act. The permittee's pump is capable of pumping more than 2 MGD; however, the permittee has set the pump motor at a maximum design intake flow of 1.6 MGD. Intake water is used for noncontact cooling water and then reused as process water.

With the pump capacity set less than 2 MGD and no intake water being used exclusively for cooling purposes, the

permittee must meet the requirements of 316(b) of the Clean Water Act on a case by case, best professional basis. If the design intake flow is greater than 2 MGD and if 25% or more of the intake water, based on actual intake flow, is used exclusively for cooling, BTA determinations for entrainment mortality and impingement mortality will be made in accordance with 40 CFR §125.90-98 and the permittee will be required to submit all the required information in 40 CFR §122.21(r). Existing facilities with intake flows less than 2 MGD or less that 25% intake water used exclusively for cooling only need to submit information specified in 40 §CFR 122.21(r)(2), (3), (5), and (8) with their permit reissuance application.

Dunn Paper has a flow meter on their intake. Once per year, the permittee shall calculate an average daily intake flow rate in MGD (using the flow meter data) and report it electronically on the discharge monitoring form. The permittee shall also calculate and report the percent of intake water used exclusively for cooling. If all cooling water is reused as process water, report the percent intake water used exclusively for cooling as 0%. The sampling frequency is annually because the facility's pump does not have the ability to exceed 2 MGD and they use 0% of intake water exclusively for cooling.

Influent Mercury Sampling: Per s. 106.145(6)(c), Wis. Adm. Code, the Department has authority to require effluent mercury monitoring when granting an alternative mercury effluent limitation for both municipal and industrial dischargers. Influent and sludge monitoring is only required by code for municipal dischargers. The Department recommends the permittee voluntarily sample for influent mercury in order to determine the intake mercury contribution to the permittee's discharge.

Water Intake Structure:

The facility meets the bolded criteria below and is therefore meeting BTA. The Department therefore does believe that the facility's intake structure represents BTA for minimizing adverse environmental impact in accordance with the requirements in section 283.31 (6), Wis. Stats. and section 316 (b) of the Clean Water Act.

Best professional judgment BTA determinations are made using the Department's 2020 *Guidance for Evaluating Intake Structures Using Best Professional Judgment*. For existing intake structures, the guidance advises that intakes deemed BTA should fulfill at least one of the following eight criteria:

1. Each water intake structure has a maximum design intake velocity of 0.5 feet per second (fps) OR a maximum actual intake velocity of 0.5 fps, demonstrated via measured or calculated values which show the maximum intake velocity as water passes through the intake system, measured perpendicular to the opening, does not exceed 0.5 fps at any point up until the first screen of mesh size 3/8" (or equivalent) or less. (This criteria is not applicable at this facility because the 3/8th inch mesh is horizontal and not submerged and criteria is meant to allow for fish to swim away from submerged screens.)
2. The facility operates a closed-cycle recirculating system that only requires make-up water with > 3 cycles of concentration on at least a daily basis. Cycles of concentration can be measured as the ratio of chloride levels in the recirculated water or blowdown relative to the chloride levels in the source water, or makeup water; or the make-up water volume divided by the blowdown volume (provided there aren't other water losses); or the blowdown water conductivity divided by the make-up water conductivity. (The facility does not meet this criterion; it does not operate a closed-cycle recirculating system)
3. The facility operates an intake structure that minimizes impingement rates by nature of its location (e.g. offshore velocity cap). (The facility does not meet this criterion; it dos not operate an intake structure that minimizes impingement rates by nature of its location)
4. The facility employs a system of technologies (e.g. wedge-wire screens, barrier nets; acoustic, light, or pH deterrent systems; variable speed pumps, etc.) that minimize impingement mortality rates. (**The facility does meet this criteria; the nature of the horizontal mesh and scouring velocity of the overflow water minimizes impingement mortality rates and allows for safe return.**)
5. The facility operates a modified traveling screen in an optimal manner that does not promote re-impingement or predation of returned organisms. (The facility does not meet this criterion; The facility does not operate a modified traveling screen)

6. The facility's intake withdraws water at > 0.25 fps less than or equal to 16% of the time up until the first screen of mesh size 3/8" (or equivalent) or less. (This criteria is not applicable at this facility because the 3/8th inch mesh is horizontal and not submerged and criteria is meant to allow for fish to swim away from submerged screens.)
7. There is data indicating that the impingement mortality rate has been/will be reduced 80-95% compared to a once-through cooling system with 3/8" traveling screens; (The facility does not meet this criterion; There is not data that indicates this)
8. There is biological data that affirmatively demonstrates that: 1) the source water body does not include threatened or endangered species in the vicinity of the intake, and 2) there are no aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure. (The facility does not meet this criterion; There is no data that indicates that there are aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure; however Eighteen animal species from the NHI Working List have been documented on the FRSF, including 10 bird, two dragonfly, four mussel, one snake, and one turtle species (Table 4). These include the State Endangered Extra-striped snaketail (Ophiogomphus anomalus), a dragonfly, and purple wartyback mussel (Cyclonaias tuberculata), as well as six State Threatened species: Red-shouldered Hawk, Cerulean Warbler, Osprey, pygmy snaketail (Ophiogomphus howei), salamander mussel (Simpsonaias ambigua), and wood turtle (Clemmys insculpta). Ten Special Concern (dnr.wi.gov/org/land/er/wlist/) animals are also known from the FRSF. Over half of the rare animals documented from the FRSF rely on wetland or aquatic habitats; several of these inhabit the Flambeau River or associated tributaries. Two of the species documented on the FRSF are globally rare (pygmy snaketail and salamander mussel).)

And at least one of the following five criteria:

- **The total water withdrawn (actual intake flow) is $\leq$ 5% of the mean annual flow of the river on which the intake is located (if on a river or stream) OR the total quantity of the water withdrawn is restricted to a level necessary to maintain the natural thermal stratification or turnover patterns (where present) except in cases where the disruption is beneficial (if on a lake or reservoir) (The actual intake flow is 0.006% of the mean annual flow)**
- The facility operates at < 8% capacity utilization rate (with pumps turned off or, if variable frequency drives exist, down substantially during periods of non-operation) or at full capacity only for portions of days during a few months or less on an annual basis. If located in a spawning area, the period of water intake operation should not correspond with times when spawning, peak egg/larval abundance, or larval recruitment is occurring (depending on species present, usually between April – October). (The facility does not operate at < 8% capacity utilization rate or at full capacity only for portions of days during a few months or less on an annual basis).
- The facility operates a closed-cycle recirculating system that only requires make-up water with $\geq$ 3 cycles of concentration on at least a daily basis. Cycles of concentration can be measured as the ratio of chloride levels in the recirculated water or blowdown relative to the chloride levels in the source water, or makeup water; or the make-up water volume divided by the blowdown volume (provided there aren't other water loses); or the blowdown water conductivity divided by the make-up water conductivity. (The facility doe not operate a closed-cycle recirculating system).
- The facility utilizes other means such as variable speed pumps, unit retirements, etc. to decrease entrainment rates by greater than or equal to 60% compared to a once-through cooling system with 3/8" traveling screens. Flow rate may be used as a surrogate for entrainment rates when determining percent reduction. (The facility minimizes water usage by reusing all spent cooling water in its industrial processes although the department believes this would not reduce the entrainment rates by greater than 60%.)
- There is biological data that affirmatively demonstrates that: 1) the source water body does not include threatened or endangered species in the vicinity of the intake, 2) there are no aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure, and 3) the department biologist concurs that operation of the intake during periods of spawning, peak egg/larval abundance, and larval recruitment will not substantially impact populations or prey bases for the fishery. (The facility does not meet this criterion; There is no data that indicates that there are aquatic life and water quality problems partly or solely due to the presence or operation of the intake structure; however Eighteen animal species from the NHI Working List have been

documented on the FRSF, including 10 bird, two dragonfly, four mussel, one snake, and one turtle species (Table 4). These include the State Endangered Extra-striped snaketail (Ophiogomphus anomalus), a dragonfly, and purple wartyback mussel (Cyclonaias tuberculata), as well as six State Threatened species: Red-shouldered Hawk, Cerulean Warbler, Osprey, pygmy snaketail (Ophiogomphus howei), salamander mussel (Simpsonaias ambigua), and wood turtle (Clemmys insculpta). Ten Special Concern (dnr.wi.gov/org/land/er/wlist/) animals are also known from the FRSF. Over half of the rare animals documented from the FRSF rely on wetland or aquatic habitats; several of these inhabit the Flambeau River or associated tributaries. Two of the species documented on the FRSF are globally rare (pygmy snaketail and salamander mussel).)

And the following criteria:

- **The facility-wide design intake flow (DIF) for all water intake structures is ≤ 2 MGD (all intake water, cooling and non-cooling, is included in the determination of whether this DIF threshold is met) OR < 25% of the total water withdrawn is used exclusively for cooling purposes (water from a public water system, treated effluents, process water, gray water, wastewater, reclaimed water, or water used in a manufacturing process before or after it is used for cooling is not considered cooling water for the purposes of this determination) (The facility uses 0% of the water withdrawn exclusively for cooling purposes.)**

Intake Screen Discharges and Removed Substances

Floating debris and accumulated trash collected on any 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.

Visual or Remote Inspections: Visual or remote inspections of the intake structure are required by 40 CFR §125.96(e).

2 Inplant - Proposed Monitoring and Limitations

Sample Point Number: 102- Field Blank Sample

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

Changes from Previous Permit:

None

Explanation of Limits and Monitoring Requirements

Permittees required to perform a mercury analysis must use an extremely sensitive test method that can be affected by even the slightest contamination not related to the mercury level in the wastewater. The purpose of a field blank sample is to determine whether the field or sample transporting procedures and environments have contaminated the sample.

3 Surface Water - Proposed Monitoring and Limitations

Sample Point Number: 001- WWTP Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Daily Max	2,743 lbs/day	5/Week	24-Hr Comp	
BOD5, Total	Monthly Avg	1,492 lbs/day	5/Week	24-Hr Comp	
Suspended Solids, Total	Daily Max	3,320 lbs/day	5/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	1,699 lbs/day	5/Week	24-Hr Flow Prop Comp	
pH (Minimum)	Daily Min	5.0 su	Daily	Continuous	
pH (Maximum)	Daily Max	9 su	Daily	Continuous	
pH Total Exceedance Time Minutes	Monthly Total	446 minutes	Daily	Calculated	
Temperature		deg F	Daily	Grab	
Phosphorus, Total	Rolling 12 Month Avg	1.0 mg/L	Weekly	24-Hr Comp	
Mercury, Total Recoverable	Monthly Avg	6.8 ng/L	Quarterly	Grab	
Mercury, Total Recoverable	Monthly Avg	32 mg/day	Quarterly	Grab	
Nitrogen, Ammonia (NH3-N) Total	Daily Max	20 mg/L	Weekly	24-Hr Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	20 mg/L	Weekly	24-Hr Comp	
PFOS		ng/L	Monthly	Grab	
PFOA		ng/L	Monthly	Grab	
Acute WET	Daily Max	1.0 TUa	See Listed Quarters	24-Hr Comp	

Changes from Previous Permit

PFOS and PFOA monitoring has been added to the permit.

Acute WET limit of 1.0 has been added.

Temperature limits have been dropped from the permit.

Phosphorus 12 month rolling average has been updated.

Phosphorus monthly average limit has been dropped.

Mercury limits have been updated.

Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements

Benzo(a)pyrene and Total Residual Chlorine – Total Residual Chlorine limits were recommended in the Water Quality Based Effluent Limit (WQBEL) memo. However, after the WQBEL memo was finalized, the facility sampled for chlorine eleven different days using an approved method (noted the previous sample method was not approved) – Ion Selective Electrode per NR 219 table B – and obtained eleven non detections (ND), as expected because the mill does not chlorinate their effluent. Therefore, a reasonable potential analysis was run a second time, and the limit is no longer recommended because the discharge no longer has reasonable potential to cause or contribute to an exceedance of water quality standards.

Benzo(a)pyrene limits were also recommended in the Water Quality Based Effluent Limit (WQBEL) memo. However, after the WQBEL memo was finalized, the facility reported that the actual sample result was a non detection, and a value was reported in error. Therefore, the discharge does not have reasonable potential to cause or contribute to an exceedance of the water quality standard, so monitoring and limits will not be included in the permit.

Mercury: A limit of 6.8 ng/L at Outfall 001 as a monthly average is recommended in the reissued permit. In addition, a corresponding mass limit is needed in accordance with s. NR 106.07(2), Wis. Adm. Code. The mass limit should be expressed as a monthly average and set equal to 32 mg/day based on the maximum 30-day average flow rate of 1.24 MGD (6.8 ng/L × 1.24 MGD × 3.78 L/gallon). Additional limits to meet expression of limits requirements in s. NR 106.07(4), Wis. Adm. Code, are not required because the reasonable potential for this limit is not shown under s. NR 106.05. Based on the effluent mercury concentrations at Outfall 001 alone, a mercury limit equal to the criteria of 1.3 ng/L would be needed. However, updates to s. NR 106.06(6), Wis. Adm. Code, allow a facility to demonstrate that an intake pollutant in the discharge does not cause, have the reasonable potential to cause, or contribute to the excursion of water quality criteria in the receiving water.

Nitrogen, Ammonia (NH3-N) – Sections NR 106.07(4) and NR 205.067(7), Wis. Adm. Code require WPDES permits contain daily maximum and monthly average limitations for industrial dischargers whenever practicable and necessary to protect water quality. **Therefore a monthly average limit of 20 mg/L is required** to meet expression of limits requirements in addition to the daily max limit.

Phosphorus – Dunn Paper exceeded the 150 lbs. per month threshold and has an alternative effluent limit (AEL) of 1.4 mg/L in the current permit based on biological phosphorus removal in s. NR 217.04(2)(a)2, Wis. Adm. Code. In 2022, the permittee determined that there was a significant relationship between effluent phosphorus concentrations and a biocide used at the facility. By adjusting the usage of this product, the facility has maintained the monthly average phosphorus concentration below 1.0 mg/L for every month since March 2022. With the permit application, the facility has requested a 1.0 mg/L TBEL instead of the AEL. **Therefore, the TBEL of 1.0 mg/L is effective upon reissuance.**

PFOS and PFOA –The need for PFOS and PFOA monitoring is evaluated in accordance with s. NR 106.98(2), Wis. Adm. Code. Previous monitoring produced a PFOS result of 14.2 ng/L and a PFOA result of 32.9 ng/L. These results are greater than one fifth of the respective criteria for each substance. Based on the type of discharge, the available PFOS/PFOA monitoring data, and known levels of PFOS/PFOA in the source water, **PFOS and PFOA monitoring is recommended at a monthly frequency.**

pH –This is a technology based effluent limit (TBEL) applicable to discharges with continuous pH monitoring. Conditions of the effluent limit are outlined in section 3.2.1.4 of the current permit. TBEL pH limits are consistent with s. NR 102.04(4)(c) and s. NR 102.05(3)(h).

Temperature – Based on the available effluent data there is no reasonable potential to exceed the calculated temperature limits. **No temperature limits are recommended in the reissued permit.**

WET – After consideration of the guidance provided in the Department's WET Program Guidance Document (2019) and other information described in the WQBEL memo annual acute WET tests are being included in the reissued permit

because a WET limit is required and because Dunn Paper is a primary industry. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued). According to the requirements specified in s. NR 106.08, Wis. Adm. Code, an acute WET limit is required. The acute WET limit shall be expressed as 1.0 TUa as a daily maximum in the effluent limits table of the permit.

Categorical Limits

The categorical effluent limits for TSS and BOD5 are proposed to be unchanged as the facility has not altered their production over the last permit term and has not indicated any planned changes. The permittee is categorized as a pulp and paper manufacturer and evaluated under Ch. NR 284, Wis. Adm. Code.

Derivation of Technology Based Effluent Limits (TBEL) for BOD5 and TSS

BOD5 Categorical Limits

Current, based on Year 1999	**Production Basis**	**BOD5 Daily Max**	**BOD5 30 Day Average**	**BOD5 Daily Max**	**BOD5 30 Day Average**
Subcategory	tons/day	lbs/ton factor	lbs/ton factor	lbs/day Limit	lbs/day Limit
20b. Non-Integrated Deink Tissue- NSPS Table 4	95.5	19.2	10.4	1833.6	993.2
18. Nonintegrated-Tissue Papers-BPT Table 1	39.9	22.8	12.5	909.72	498.75
			BOD5 Limits in Existing Permit	2743	1492

Year 2023	**Production Basis**	**BOD5 Daily Max**	**BOD5 30 Day Average**	**BOD5 Daily Max**	**BOD5 30 Day Average**
Subcategory	tons/day	lbs/ton factor	lbs/ton factor	lbs/day Limit	lbs/day Limit
20b. Non-Integrated Deink Tissue- NSPS Table 4	150	19.2	10.4	2880	1560
18. Nonintegrated-Tissue Papers-BPT Table 1	175	19.2	10.4	3360	1820
Potential New BOD5 Permit Limits Subject to Antidegration (NR 207)				**6240**	**3380**

TSS Categorical Limits

Current, based on Year 1999	**Production Basis**	**TSS Daily Max**	**TSS 30 Day Average**	**TSS Daily Max**	**TSS 30 Day Average**
Subcategory	tons/day	lbs/ton factor	lbs/ton factor	lbs/day Limit	lbs/day Limit
20b. Non-Integrated Deink Tissue- NSPS Table 4	95.5	26.2	13.6	2502.1	1298.8
18. Nonintegrated-Tissue Papers- BPT Table 1	39.9	20.5	10	817.95	399
			TSS Limits in Existing Permit	3320	1698

Year 2023	**Production Basis**	**TSS Daily Max**	**TSS 30 Day Average**	**TSS Daily Max**	**TSS 30 Day Average**

Subcategory	tons/day	lbs/ton factor	lbs/ton factor	lbs/day Limit	lbs/day Limit
20b. Non-Integrated Deink Tissue- NSPS Table 4	150	26.2	13.6	3930	2040
18. Nonintegrated-Tissue Papers- BPT Table 1	175	26.2	13.6	4585	2380
Potential New TSS Permit Limits Subject to Antidegration (NR 207)				**8515**	**4420**

4 Land Application - Sludge/By-Product Solids (industrial only)

Sampling Point (Outfall) 002 - WWTP Sludge

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	1/ 6 Months	Grab Comp	
pH Field		su	1/ 6 Months	Grab Comp	
Nitrogen, Total Kjeldahl		mg/kg	1/ 6 Months	Grab Comp	
Nitrogen, Ammonia (NH_3-N) Total		mg/kg	1/ 6 Months	Grab Comp	
Phosphorus, Water Extractable		mg/kg	1/ 6 Months	Grab Comp	
Phosphorus, Total		mg/kg	1/ 6 Months	Grab Comp	
Potassium, Total Recoverable		mg/kg	1/ 6 Months	Grab Comp	
Calcium Dry Wt		mg/kg	1/ 6 Months	Grab Comp	
Zinc Dry Wt		mg/kg	1/ 6 Months	Grab Comp	
PCB Total Dry Wt		mg/kg	1/ 6 Months	Grab Comp	
Dioxin, 2,3,7,8-TCDD Dry Wt		ng/kg	1/ 6 Months	Grab Comp	
Furan, 2,3,7,8-TCDF Dry Wt		ng/kg	1/ 6 Months	Grab Comp	
Chloride		mg/kg	Annual	Grab Comp	
Lead, Dry Wt		mg/kg	Annual	Grab Comp	
Copper, Dry Wt		mg/kg	Annual	Grab Comp	
Nickle, Dry Wt		mg/kg	Annual	Grab Comp	
Cadmium Dry Wt		mg/kg	Annual	Grab Comp	
Chromium, Dry Wt		µg/kg	Annual	24-Hr Flow Prop Comp	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Dioxin, 2,3,7,8-TCDD TE		ng/kg	Once	Calculated	
Priority Pollutant Scan			Once	Grab	As specified in ch. NR 215.03 (1-6), Wis. Adm. Code (excluding asbestos). Use grab samples for mercury, cyanide and VOCs. Use 24-hr flow proportional samples for all other parameters.
PFAS Dry Wt			1/ 6 Months	Grab	Perfluoroalkyl and Polyfluoroalkyl Substances based on updated DNR PFAS List. See PFAS Section below for more information.
Dioxins & Furans (all congeners)			Once	Composite	As specified in ch. NR 106.115, Wis. Adm. Code.

Changes from Previous Permit:

PFAS monitoring requirements have been added to the permit based on the type of waste produced, previous sample results, and because it is required by the facility's Land Application Management Plan.

Explanation of Limits and Monitoring Requirements

All sludge application requirements are required by the facility's 2022 land application management plan.

Site Reporting requirements: The facility is required to fill out Form 3400-055 for any and all application to DNR approved sites. When the facility applies to non DNR approved sites under their DATCP certification the application must be reported on Form 3400-052. Sampling requirements listed in this section are applicable regardless of the site onto which the facility applies sludge.

Sludge regulated by DATCP: the facility has been licensed with the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) under Wis. Stat. SS 94.66 and Wis Admin. Code SS ATCP 41 as a lime distributor where Dunn Lists the grade and type of lime they will distribute. License number 28-026916-000000 first issued on 1/12/2021.

Monitoring for Nitrogen, Phosphorus, Potassium, and Calcium: Monitoring for these parameters is included in the permit to accurately document the beneficial properties of the permittee's sludge. The permittee informs the farmer of the amounts of nitrogen, phosphorus, potassium, and calcium applied to the field through a receipt of application. The farmer can then determine additional amounts of nutrients to be applied based. To ensure these values are accurate for the farmer, monitoring is proposed to remain at 1/6 months or (based on a spring/fall spreading schedule).

Section NR 518.06, Wis. Adm. Code Parameters: Only sludges that have been exempted from the solid waste landspreading requirements of Ch. NR 518, Wis. Adm. Code, that do not have detrimental effects on the soil, crops, or groundwater, and that have been shown to have beneficial properties as a soil conditioner or fertilizer may be spread on the land. Industrial facilities seeking exemption pursuant to s. NR 518.04(4), Wis. Adm. Code, must analyze sludge in accordance to s. NR 518.06(1). Section NR 518.06(1)(e), Wis. Adm. Code requires industrial facilities that are seeking to land apply wastewater treatment system sludge to test the sludge for pH, nutrients, salts, metals, and the priority pollutants. This monitoring will allow the Department to reevaluate the sludge characteristics when the permit is reissued. To ensure the monitoring information is available to the Department prior to permit expiration, the proposed permit specifies that the one-time test should be performed in 2027.

Priority Pollutant Scan: A priority pollutant scan is required at least once per permit term as part of the waste characterization and beneficial use determination per s. NR 518.06(1)(e)(6), Wis. Adm. Code.

Nitrogen Loading Limitations: The loading rate of 240 lbs/ac-yr in the current permit was for soybeans and alfalfa crops. The permit clarifies that the TKN loading rate shall not exceed 165 lbs/ac-yr when plant nitrogen is not taken into consideration. If plant available nitrogen is considered, Nutrient application guidelines for field, vegetable, and fruit crops in Wisconsin. A2809. Univ. of Wisconsin Ext., Madison should be consulted for nitrogen application rates for specific crops. The formula for calculating pounds of TKN per acre has been modified for using mg/kg instead of percent. A mineralization study was conducted in 2009 and indicated mineralization rates of 12% and 16% in years 3 and 4 respectively. The mineralization rates may be used in the calculation of nitrogen.

Chloride Loading Limitations: Section NR 214.18(4), Wis. Adm. Code does not have a numeric chloride limitation for sludge landspreading like s. NR 214.17(4)(d)(7), Wis. Adm. Code does for liquid and by-product wastes. However, pursuant to s. NR 214.18(4)(b),Wis. Adm. Code the sludge application rate shall be limited so that any parameter that may affect groundwater quality is restricted to minimize the concentration of the substance in the groundwater to the extent technically and economically feasible and to prevent exceedance of the preventative action limit in the groundwater. This allows the Department to set limits for chlorides for the landspreading of sludge. The numerical limit defined in s. NR 214.17(4)(d)(7), Wis. Adm. Code is used as a limit for the permittee's sludge. The limit is proposed to be the same as the current permit at 170 lbs of chloride per acre per year. The formula for calculating the pounds of chloride per acre has been revised to accommodate sample results in mg/kg instead of percentages. In order to prevent flags in the Department's SWAMP database, Dunn Paper shall report the chloride loadings on their Annual Land Application Form 3400-55. Dunn Paper is required to monitor for chlorides on an annual basis to properly fill out the annual land application form.

Metals Limitations: The formula for calculating the pounds of metal per acre has been revised to accommodate sample results in mg/kg as opposed to percentages.

Total Dioxin Equivalents (TDE) Limitations: These are being included due to the nature of the recycled material brought into the papermill and to match the 2022 Land Application Management Plan.

Calculating Dioxin Toxic Equivalence: This section provides instructions to the permittee on how to calculate the dioxin toxic equivalence (TEQ) using the sample results of the seventeen 2,3,7,8-substituted dioxins and furans. This method of calculating dioxin toxicity is more accurate because it takes into consideration all seventeen congeners instead of the two most toxic (2,3,7,8-TCDD and 2,3,7,8-TCDF). If sampling is required from the prediction of TDE cumulative loadings as described in section 4.4.2 of the permit, the permittee shall calculate the TEQ from the sample results and submit the sample results and calculated TEQ to the Department.

Annual Land Application Report (Form 3400-055): The permittee shall report the amount of waste on a dry weight basis. To calculate on a dry weight basis, the permittee shall use the average of the last four percent total solids samples and multiply that by the amount of wet tons of sludge. Section NR 214.02(2), Wis. Adm.

Code specifies that the generator of the waste is responsible for the handling and land application of the waste. Therefore, it is the permittee's responsibility to coordinate with farmers on additional nitrogen added so it can be accurately reported on Form 3400-055.

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 an update to the management plan to optimize the land application system performance and demonstrate compliance with Wisconsin Administrative Code NR 214.	01/01/2025

5.2 Annual Certification Statement

Permittees not using chlorophenolic − containing biocides shall certify to the department that they are not using these biocides.

Required Action	Due Date
Annual Certification Statement: The permittee shall submit a signed annual certification statement to the Department by January 31st of the following year that the facility did not use chlorophenolic − containing biocides for the previous year. If the facility plans to start using chlorophenolic − containing biocides then the facility must notify the department in advance so the permit may be modified prior to discharging chlorophenolic − containing biocides.	January 31 of each year

5.3 Land Treatment Annual Report

The permittee must submit an annual report summarizing the cumulative total metals, TDE, nitrogen, chloride, and PCB loadings. To allow the Department to electronically track submittals, the submittal dates are included as a schedule of compliance.

Required Action	Due Date
Submit Annual Cumulative Loadings Report #1: The permittee must submit an annual report summarizing the cumulative total metals, TDE, nitrogen, chloride, and PCB loadings by January 31st for the previous calendar year.	01/31/2024
Submit Annual Cumulative Loadings Report #2: The permittee must submit an annual report summarizing the cumulative total metals, TDE, nitrogen, chloride, and PCB loadings by January 31st for the previous calendar year.	01/31/2025
Submit Annual Cumulative Loadings Report #3: The permittee must submit an annual report summarizing the cumulative total metals, TDE, nitrogen, chloride, and PCB loadings by January 31st for the previous calendar year.	01/31/2026
Submit Annual Cumulative Loadings Report #4: The permittee must submit an annual report summarizing the cumulative total metals, TDE, nitrogen, chloride, and PCB loadings by January 31st for the previous calendar year.	01/31/2027
Submit Annual Cumulative Loadings Report #5: The permittee must submit an annual report summarizing the cumulative total metals, TDE, nitrogen, chloride, and PCB loadings by January 31st	01/31/2028

for the previous calendar year.	

Explanation of Schedules

Land Application Management Plan updates: The facility shall submit land application management plans.

Chlorophenolic Containing Biocides Certification: This certification is required pursuant to s. NR 284.12(3)(d), Wis. Adm. Code. By including the report as a compliance schedule item, the permittee and Department are able to track the submittals.

Land Treatment Annual Report: The permittee must submit an annual report summarizing the cumulative total metals, TDE, nitrogen, chloride, and PCB loadings as mentioned in the land treatment section of the permit. To allow the Department to electronically track submittals, the submittal dates are included as a schedule of compliance.

Special Reporting Requirements

PCP and TCP limitations are only applicable to facilities where chlorophenolic containing biocides are used. Permittees not using chlorophenolic containing biocides shall certify to the Department that they are not using these biocides pursuant to s. NR 284.12(3)(d), Wis. Adm. Code.

Zinc limitations are only applicable to groundwood facilities where zinc hydrosulfite is used as a bleaching agent; this facility does not meet this criteria.

Other Comments:

The requirement: “The permittee shall maintain a record of the dosage rate of all additives used on a monthly basis. The additives may be changed during the term of the permit following procedures in the ‘Additives’ subsection of the Standard Requirements.” has been added to the permit. This requirement references all additives used in the treatment system.

Attachments:

Water Flow Schematic(s)

Map(s)

Water Quality Based Effluent Limits

Proposed Expiration Date:

December 31, 2028

Justification Of Any Waivers From Permit Application Requirements

None

Prepared By: Jonathan Hill Wastewater Engineer

Date: November 15, 2023