

Permit Fact Sheet

General Information

Permit Number:	WI-0000540-10-0
Permittee Name:	Kimberly Clark Corporation
Address:	3120 Riverside Ave
City/State/Zip:	Marinette WI 54143
Discharge Location:	Outfalls 001: South bank of the Menominee River, one quarter mile up stream of the Hattie Street Bridge Outfall 004: discharged into turbine generator intakes on south side of the Menominee River, one quarter mile upstream of the Hattie Street Bridge.
Receiving Water:	Menominee River (WBIC = 609000)
StreamFlow (Q _{7,10}):	1240 cfs
Stream Classification:	Warmwater sportfish community, not classified as a public water supply NOTES: 1) For bioaccumulative chemicals of concern (BCCs), criteria are based on a classification as a coldwater community and public water supply since this permittee is located in the Great Lakes basin. 2) The Menominee River at Marinette is currently classified as an Impaired Water for PFOS, mercury and PCBs. Of those, only mercury and PFOS is currently detected in Marinette's effluent.

Facility Description

Kimberly-Clark Corporation at Marinette operates a non-integrated paper mill and converting operations producing sanitary tissue paper products. Employing a single paper machine, #5 Tissue Machine, the Marinette Mill produces 193 air dry standard tons per day of sanitary tissue products from purchased pulp. Paper rolls are converted to consumer products on various converting units. Paper machine maximum production rates over the course of current permit: Daily max = 225.6 tons per day; Monthly max = 190.8 average tons per day; Yearly max = 171.7 average tons per day. The current permit rate of 193 tons per day continues to represent the paper making process maximum production capability.

Discharge Description

The Marinette Mill treats its process wastewaters in addition to groundwater seepage, stormwater, boiler blowdown and leachate from Kimberly-Clark's Oconto Falls Landfill using flocculation and sedimentation in a primary clarifier **aided by polymers** followed by polishing in an earthen lagoon. Sludge dewatering is aided by polymers using a belt press.

Substantial Compliance Determination

Enforcement During Last Permit: The facility has completed all previously required actions as part of the enforcement process.

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on September 19, 2023, this facility has been found to be in substantial compliance with their current permit. The treatment plant was found in compliance with the effluent limits and all terms and conditions of the permit. The following actions are needed:

- The facility will need an Operator with advanced certification and the following subclasses: Solids Separation (B) and Biological Solids/Sludge Handling, Processing & Reuse (C) by September 5, 2026.

Sample Point Designation		
Sample Point Number	Discharge Flow, Units, and Averaging Period	Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)
702	N/A	Intake number 702 represents the surface water intake located at the Park Mill Powerhouse.
001	Two emergency overflows have occurred since the current permit issuance. These overflows happened on 5/24/2019 and 3/6/2020. The Maximum daily and maximum annual average occurred on 5/24/2019.	Contributing water sources include continuous discharge of uncontaminated groundwater seepage, stormwater and infrequent Filtered River Water Tank emergency overflow. Mill steam condensate and noncontact cooling water are recycled back to the Filtered River Water Tank. At Sampling Point 001, overflow from the Filtered River Water Tank shall be monitored prior to combining with groundwater seepage and stormwater and prior to discharge via Outfall 001 to the Menominee River one quarter mile upstream of the Hattie Street Bridge.
004	Maximum Daily of 2.860 MGD on 07/01/2018; Maximum annual average of 1.117 MGD in 2021.	Combined process wastewaters are treated and sampled prior to discharge. Discharge sources include papermaking and converting operations wastewater, Kimberly-Clark Oconto Falls Landfill leachate, steam plant and utilities operations water, groundwater and any other auxiliary mill process water and stormwater. At Sampling Point 004, wastewater treatment system lagoon effluent shall be monitored, after combining with clarifier effluent if bypassing of the lagoon occurs, but prior to discharge to the Menominee River one quarter mile upstream of the Hattie Street Bridge.
106	N/A	DMR Sample Point for Reporting Mercury Field Blank Results

1 Influent – Cooling Water Intake Structure - Proposed Monitoring

Sample Point Number: 702- Intake 702

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		Percent	Monthly	Calculated	

Changes from Previous Permit

None.

Explanation of Limits and Monitoring Requirements

Flow and percent used exclusively for cooling are needed to determine applicable regulations for the intake structure.

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:

Point of Compliance: The National Wildlife Federation vs. Gorsuch decision states that water passing through a dam does not constitute a discharge in the NPDES system. Therefore, it remains waters of the state as it passes through the dam. As a result, the point of withdrawal and point at which the through-screen velocity is calculated is inside the dam's turbine pits. At this facility, this is at the deep well pump and shallow well pump.

Location: The Marinette Mill obtains Menominee River water from the hydroelectric powerhouse located at Latitude 45°06'21.6", Longitude 87°39'05.7" (on the WKID: 4326 DMS datum) along the south bank of the Menominee River, upstream of the Hattie street bridge.

Maximum Through-Screen Design Intake Velocity: The through-Screen Design Intake Velocity at the fish guidance rack owned and operated by the dam is 1.8 feet per second (fps), and the sweeping velocity along the rack is 1.27 fps. However, the point at which the design intake velocity is calculated for purposes of evaluating the mill's intake (not including withdrawals by the dam for hydropower) is at the point at which water is withdrawn from waters of the state. At this mill, this is at deep well pump and shallow well pump, and the calculated maximum intake velocities are 8.2 fps and 1.8 fps respectively.

Source Waterbody Information:

- 7-Q₁₀ = 1240 cfs (cubic feet per second)
- 7-Q₂ = 1740 cfs
- 90-Q₁₀ = 1590 cfs
- Harmonic Mean Flow = 2650 cfs

General Description: General Description: two pumps are installed in the turbine room. The shallow well pump and the deep well pump are controlled with variable speed drives and only one pump can be operated at a time. The maximum design capacity of the larger, deep well pump is 11.5 MGD (17.793 cubic feet/second), significantly higher than the reported water usage of approximately 0.9 MGD. The maximum design capacity of the smaller, shallow well pump is 2.6 MGD (4.023 cubic feet / second).

Major Components: Both of the pumps are controlled with variable speed drives, and only one pump can be operated at a time. The shallow pump intake has a 14-inch diameter, 8-inch tall basket strainer. The deep well has a 16-inch diameter suction pipe without a screen. Previously the turbines and pumps were protected from damage by trash racks; these trash racks have been replaced in 2013 with a fish guidance rack installed at a 45-degree angle. The project was conducted in accordance of the hydro-electric operating license and in cooperation with the FERC, MiDNR, WDNR, USF&WL, and Eagle Creek Renewable Energy. A rack cleaning system was also installed to provide mechanical assist to the manual cleaning process.

The height of the fish return rack is approximately 21 ft., and a width/length of 82 1/2 ft. The "Turbine Room" or flume is approximately 104 ft. long and 85 ft wide. The usual depth of the water is 18 ft deep to the bottom subfloor. Lastly, there is no way to hold back water at the discharge areas for the turbines. The openings at the discharge wall are smaller than the entire opening of the turbine room, according to the drawings, there are 8 discharge bays along the flume wall and they are approximately 8 ft. wide by 7 ft. tall.

- **Design and actual velocity and flow through the fish guidance rack:** The maximum approach velocity perpendicular to the rack is 1.8 feet per second (fps), and the sweeping velocity along the rack is 1.27 fps. A new rack cleaning system was also installed providing some mechanical assist to the manual cleaning process. There are no calculations to provide; the approach velocities were taken from 2013 fish guidance rack project documents.
- **Maximum Design Intake Flow (DIF):** 14.1 MGD
- **Actual Average Intake Flow:** The actual intake flow (DIF) is 0.9 MGD (1.393 cfs)

- **Actual Intake Velocity::** The maximum intake velocity is 0.01 fps through the shallow well pump and 0.09 fps through the deep well pump. the actual intake velocity is on average 0.004 fps through the shallow well pump at 0.9 MGD
- **Percent Used Exclusively for Cooling:** 4.1 percent used exclusively for cooling.

Percent of intake water used compared to river flow is less than 5% of the mean annual flow: The estimated harmonic mean flow of the Menominee River's is 2,650 cfs with a 7Q10 flow of 1240 cfs. The design intake flow from the larger pump 11.5 MGD = 17.793 cfs, which is equivalent to approximately **0.83%** of the harmonic mean flow and approximately **1.7%** of the 7Q10.

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 average intake over flow (river return) volume is 0.7 MGD. Intake water is used for noncontact cooling water and then reused as process water.

With the average pump rate of 1 MGD and 4.1% of the 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.

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.

BTA determination:

The intake structure is subject to 316(b) of the Clean Water Act and 283.31 (6) Wis. State Statute. The intake structure is not subject to 40 CFR 125 subpart J because less than 25% of the withdrawn water is used exclusively for cooling.

Pursuant to s. 283.31(6), Wis. Stats., Any WPDES discharge permit that limits the discharge of one or more pollutants may require that the location, design, construction, and capacity of the permittee facility's surface water intake structure reflect best technology available (BTA) for minimizing adverse environmental impacts. Section 316(b) of the Clean Water Act (33 U.S.C. 1326(b)) is similar but emphasizes cooling water intakes.

Since Kimberly-Clark holds a WPDES permit that limits the discharge of several pollutants and withdraws water from the Menominee River, a BTA determination is required.

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 less than 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. (the facility does meet this criteria.)

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 does 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 through use of the variable speed pumps and two different pump sizes; the water intake structure does provide aquatic life protection by means of the fish guidance rack and bypass system recently installed in the power canal.)**
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 criteria; 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. (The facility does not meet this criteria.)
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 criteria because lake sturgeon are found within the waterbody; their proximity to the intake is highly variable and would depend on the time of year and discharge.)

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 facility meets this criteria because the 1% of the harmonic mean flow and approximately 2% of the 7Q10.)**
- 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 losses); or the blowdown water conductivity divided by the make-up water conductivity. (The facility does 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 does not meet this criteria. The facility minimizes water usage by varying pump rates, although the department does not have information showing that 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 criteria because lake sturgeon are found within the waterbody; their proximity to the intake is highly variable and would depend on the time of year and discharge. There are no known aquatic life or water quality problems partly or solely due to the presence or operation of the intake structure)

And the following criteria:

- **The facility-wide design intake flow (DIF) for all water intake structures is \leq 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’s DIF is 11.5 MGD, which is greater than the 2 MGD threshold. However, the mill uses 4.1% of the water withdrawn exclusively for cooling purposes, which is below the 25% cooling water threshold.)**

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.

Additional information: The dam’s fish guidance rack reduces the amount of fish entering the turbine room which reduces the amount of fish available to be impinged or entrained by the mill’s intake structure.

No impingement and entrainment studies of the Marinette Mill’s fresh water intake pumps have been performed. However, fish entrainment and mortality studies of the hydro-electric plant were performed in 1987 and 1990 through 1991. The results of the studies as conducted by the mill’s consultant, the Wisconsin DNR, and the Federal Energy Regulatory Agency ranged from 48,735 to 80,613 fish entrained per year and 11,846 to 30,561 fish killed per year (24.3-25.5% of fish entrained are killed by the turbines owned and operated by the dam.) The mill withdraws 1% of the mean harmonic flow of the river, meaning their portion of the withdrawal is responsible for approximately that fraction of the mortality.

2 Inplant - Proposed Monitoring and Limitations

Sample Point Number: 106- Field Blank Results

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

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Recoverable					
PFOS		ng/L	Monthly	Blank	
PFOA		ng/L	Monthly	Blank	

Changes from Previous Permit:

The outfall name has been updated from “Mercury Field Blank Results” to “Field Blank Results”.

PFOS and PFOA blanks have been added to the permit.

Explanation of Limits and Monitoring Requirements

Field blank samples for mercury, PFOA, and PFOS are needed to determine accuracy of samples taken at other sample points.

3 Surface Water - Proposed Monitoring and Limitations

Sample Point Number: 001- Filtered Water Tank

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	At Discharge	Estimated	

Changes from Previous Permit

None.

Explanation of Limits and Monitoring Requirements

It is necessary to provide a location on the DMRs for the facility to report flow in the case of a discharge from this outfall.

Sample Point Number: 003- 004 and 005 Combined

Changes from Previous Permit

This outfall has been removed.

Explanation of Limits and Monitoring Requirements

Since Outfall 005 is being removed it is no longer necessary to have the virtual combined outfall 003.

Sample Point Number: 004- Treated Process WW

Monitoring Requirements and Limitations					
Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	5/Week	24-Hr Comp	
BOD5, Total	Daily Max	4,400 lbs/day	5/Week	Calculated	
BOD5, Total	Monthly Avg	2,413 lbs/day	5/Week	Calculated	
Suspended Solids, Total		mg/L	5/Week	24-Hr Comp	
Suspended Solids, Total	Daily Max	3,957 lbs/day	5/Week	Calculated	
Suspended Solids, Total	Monthly Avg	1,930 lbs/day	5/Week	Calculated	
Temperature Maximum		deg F	3/Week	Continuous	
Mercury, Total Recoverable		ng/L	Quarterly	Grab	
pH (Maximum)	Daily Max	9.0 su	Daily	Continuous	
pH (Minimum)	Daily Min	5.0 su	Daily	Continuous	
pH Exceedances Greater Than 60 Minutes	Monthly Total	0 Number	Daily	Calculated	
pH Total Exceedance Time Minutes	Monthly Avg	446 minutes	Daily	Calculated	
Phosphorus, Total		mg/L	Quarterly	24-Hr Comp	
PFOS		ng/L	Monthly	Grab	
PFOA		ng/L	Monthly	Grab	
Acute WET		rTUa	See Listed Qtr(s)	24-Hr Flow Prop Comp	

Changes from Previous Permit

PFOS and PFOA, and Temperature monitoring has been added to the permit as per the WQBEL memo dated May 15, 2023.

BOD5 and TSS concentration reporting has been added to this permit.

Sample frequency for BOD5 and TSS has been changed from “at discharge” to “5/week”; the facility should report “no discharge” if no discharge occurred.

Categorical limits for BOD and TSS has been added to this outfall and removed from Outfall 003.

The pH exceedances total minutes and greater than 60 minutes has been added to this permit.

Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements and Disinfection (if applicable)

Mercury- Mercury limits are not included at outfall 004 based on the Water Quality Based Effluent Memo. Mercury monitoring is remaining in the permit to allow for another reasonable potential analysis to be conducted at the next permit reissuance.

pH- The pH limits are required in accordance with s. NR 106.98(2), Wis. Adm. Code.

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 <0.113 ng/L and a PFOA result of 0.236 ng/L. Based on the discharge category PFOS and PFOA monitoring is recommended at a monthly frequency.

The department may add PFAS monitoring requirements to the permit for waste being hauled to licensed (Waste & Materials or out of state) landfill owned by a different entity. Adding monitoring requirements is current policy of the department.

Phosphorus- The discharge does not have reasonable potential to cause or contribute to an exceedance of the water quality criterion because the 30-day P99 of reported effluent total phosphorus data is less than the calculated WQBEL. Therefore, a WQBEL is not required, however monitoring is being included to allow for a reasonable potential analysis to be conducted at the next permit reissuance.

Temperature- No limits are necessary based on the procedures in s. NR 106.56, Wis. Adm. Code. Monitoring will be included in this permit term to allow for a reasonable potential analysis to be conducted at the next permit reissuance.

Whole Effluent Toxicity (WET)- The need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. And the WET checklist.

Categorical Limits

The Total BOD5 and Total Suspended Solids limits are carried over from the previous permit. The permit application stated that the current permit rate of 193 tons per day continues to represent the paper making process maximum production capability.

BPT Effluent Limitations

Production Rates: Kimberly-Clark's reissuance applications indicate a peak annual average production rate of 193 ADST/day. Therefore, the proposed permit's TBELs are derived from 193 ADST/day.

BPT Effluent Limitations Calculation:

Applicable Limits from s. NR 284.12 (1), Wis. Adm. Code

Subcategory	Effluent Limitations
Nonintegrated-Tissue Papers s. NR 284.12 (1)(a)18.	22.8 lbs BOD ₅ /ton of production Daily Maximum
	12.5 lbs BOD ₅ /ton of production Monthly Average
	20.5 lbs TSS/ton of production Daily Maximum
	10.0 lbs TSS/ton of production Monthly Average

BOD₅:

193 TPD x 22.8 lbs BOD₅/T = 4,400 lbs BOD₅ Daily Maximum

193 TPD x 12.5 lbs BOD₅/T = 2,413 lbs BOD₅ Monthly Average

TSS:

193 TPD x 20.5 lbs BOD₅/T = 3,957 lbs TSS Daily Maximum
 193 TPD x 10.0 lbs BOD₅/T = 1,930 lbs TSS Monthly Average

Sample Point Number: 005- Mill Emergency Overflow
Changes from Previous Permit

This outfall has been removed because the department does not permit emergency overflows. If an overflow occurs the facility is required to report it as described in the emergency discharge section of the permit.

Explanation of Limits and Monitoring Requirements

Consistent with other permits, emergency discharges are to not have their own outfall. Emergency discharges shall be reported as required in the Controlled Diversion subsection of the Standard Requirements section of the permit.

4 Off-site disposal - Sludge/By-Product Solids (industrial only)

4.1.1 Sampling Point (Outfall) 006 - offsite disposal

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

Changes from Previous Permit:

This outfall is being added to the permit to record the wastewater treatment sludge sent off-site to a licensed landfill.

Explanation of Limits and Monitoring Requirements

PFOA and PFOS- The presence and fate of PFOA and PFOS in municipal and industrial sludges is an emerging public health concern. EPA is currently developing a risk assessment to determine future land application rates and expects to release this risk assessment by the end of 2024. In the interim, the department has developed the “Interim Strategy for Land Application of Biosolids and Industrial Sludges Containing PFOA and PFOS.

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

5 Schedules

5.1 Annual chlorophenolic-containing biocides Certification

The Permittee must submit a signed certification statement no later than January 31 for the previous year certifying that the facility did not use chlorophenolic-containing biocides.

Required Action	Due Date
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Annual Intake Certification Statement: The Permittee must submit a signed certification statement no later than January 31 for the previous year certifying that the facility did not use chlorophenolic-containing biocides. See the Standard Requirements section of the permit for details on notification requirements if the permittee desires to use additional additives.	January 31 of each year.
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5.1 PFOS/PFOA Minimization Plan Determination of Need

Submit sampling data to be used to determine the need for PFOS and PFOA monitoring and limits.

Required Action	Due Date
<p>Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code.</p> <p>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.</p>	03/31/2026
<p>Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan.</p> <p>This report shall include all additional PFOS and PFOA data that may be collected including any influent, intake, in-plant, collection system sampling, and blank sample results.</p> <p>The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan.</p> <p>If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued.</p> <p>If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.</p>	03/31/2027

5.2 Sludge Management Plan

A management plan is required for the sludge management system.

Required Action	Due Date
Sludge Management Plan: Submit a management plan to optimize the land application performance and demonstrate compliance with Wisconsin Administrative Code NR 214.	03/31/2027

Explanation for Annual chlorophenolic-containing biocides Certification: Wis Adm Code 284/12(2) requires facilities to have limits for PCP, TCP and zinc unless the facilities certify that they do not use chlorophenolic-containing biocides; this schedule gives the facility a place to certify the lack of chlorophenolic-containing biocides. If the permittee decides to start using chlorophenolic-containing biocides, the permittee will be required to request approval by the Department and will not be permittee to use chlorophenolic-containing biocides unless approved by the department. If the Department approves use chlorophenolic-containing biocides, the permit will be modified to include limits for PCP, TCP and zinc.

Explanation for PFAS Determination of Need: This schedule is needed to determine the need for PFOS and PFOA monitoring and limits.

Explanation for Sludge Management Plan: The department requires that the facility report the source of the sludge as well as treatment and disposal details to ensure the proper regulations are being

Special Reporting Requirements

None.

Other Comments:

Kimberly Clark submitted certification with the application that the Marinette Mill does not use chlorophenolic-containing biocides. Therefore, pursuant to s. NR284.12 (2) (b), the proposed permit does not contain technology-based limitations for either pentachlorophenol (PCP) or trichlorophenol (TCP).

Attachments:

Water Quality Based Effluent Limits

Proposed Expiration Date:

September 30, 2029

Justification Of Any Waivers From Permit Application Requirements

NA.

Prepared By:

Jonathan Hill Wastewater Engineer

Date: June 24, 2024

DATE: May 15, 2023

TO: Jonathan Hill

FROM: Rachel Fritz

SUBJECT: Water Quality-Based Effluent Limitations for Kimberly Clark Corporation Marinette
WPDES Permit No. WI-0000540-10-0

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from Kimberly Clark Corporation Marinette in Marinette County. This industrial discharges to the Menominee River, located in the Wausaukee and Lower Menominee River Watershed in the Menominee River Basin. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at each outfall:

Outfall 004 – Treated Process Wastewater

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅						1
TSS						1
pH	9.0 s.u.	5.0 s.u.				2
Mercury						1
PFOS and PFOA						3
Phosphorus						1
Temperature						1
Acute WET						4

Outfall 003 – Combined Outfalls 004 and 005

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD ₅	4,400 lbs/day			2,413 lbs/day		5
TSS	3,957 lbs/day			1,930 lbs/day		5

Footnotes:


1. Monitoring only.
2. This is a technology based effluent limit (TBEL) applicable to discharges with continuous pH monitoring. Conditions of the effluent limit are outlined in section 3.2.3.2 of the current permit. TBEL pH limits are consistent with s. NR 102.04(4)(c) and s. NR 102.05(3)(h).
3. Monthly monitoring is required in accordance with s. NR 106.98(2), Wis. Adm. Code.
4. Annual acute WET tests are recommended in the reissued permit. The Acute Mixing Zone (AMZ) to assess acute test results is 9%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), the dilution water

used in WET tests conducted on Outfall 004 shall be a grab sample collected from the receiving water. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

5. The mass limits are categorical limits based on ch. NR 284, Wis. Adm. Code. These limits are not addressed in this memo and may need to be adjusted based on current production.

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Rachel Fritz at Rachel.Fritz@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (2) – Narrative & Map

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**Water Quality-Based Effluent Limitations for
Kimberly Clark Corporation Marinette**

WPDES Permit No. WI-0000540-10-0

Prepared by: Rachel Fritz

PART 1 – BACKGROUND INFORMATION

Facility Description

Kimberly-Clark Corporation at Marinette operates a non-integrated paper mill and converting operations producing sanitary tissue paper products. The Marinette Mill treats its process wastewaters in addition to groundwater seepage, stormwater, boiler blowdown and leachate from Kimberly-Clark’s Oconto Falls Landfill using flocculation and sedimentation in a primary clarifier followed by polishing in an earthen lagoon. The treated process wastewater is discharged to the Menominee River via Outfall 004.

Outfall 001 is a discharge of groundwater seepage, stormwater, and infrequent steam condensate and noncontact cooling water. Discharge from this outfall has occurred twice in the last five years. Outfall 002 has been physically blocked and no longer discharges. Outfall 005 is an emergency overflow outfall for the base mill lift station which has not occurred in the last five years. Discharge may include steam plant discharge, mill utilities water, noncontact cooling water, seal water, groundwater, stormwater, and landfill leachate. Outfall 003 represents the combined discharge of Outfalls 004 and 005 in the permit. This memo focuses on the discharges from Outfalls 003 and 004.

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

Existing Permit Limitations

The current permit, which expired on March 31, 2023, includes the following effluent limitations and monitoring requirements. At Outfall 001 flow rate monitoring is required and at Outfall 005, flow rate, discharge time, BOD, TSS, and pH monitoring is required.

Outfall 004 – Treated Process Wastewater

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Flow Rate						1
BOD ₅						1
TSS						1
pH	9.0 s.u.	5.0 s.u.				2
Mercury						1
Phosphorus						1
Acute WET						1

Outfall 003 – Combined Outfalls 004 and 005

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD ₅	4,400 lbs/day			2,413 lbs/day		3
TSS	3,957 lbs/day			1,930 lbs/day		3

Footnotes:

1. Monitoring only.
2. This is a technology based effluent limit (TBEL) applicable to discharges with continuous pH monitoring. Conditions of the effluent limit are outlined in section 3.2.3.2 of the current permit. TBEL pH limits are consistent with s. NR 102.04(4)(c) and s. NR 102.05(3)(h).
3. The mass limits are categorical limits based on ch. NR 284, Wis. Adm. Code.

Receiving Water Information

- Name: Menominee River
- Waterbody Identification Code (WBIC): 609000
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q₁₀ and 7-Q₂ values are from USGS for the Menominee River at Marinette where Outfalls 001, 004, and 005 are located. The Harmonic Mean has been estimated as recommended in *State of Wisconsin Water Quality Rules Implementation Plan* (Publ. WT-511-98)
 - 7-Q₁₀ = 1240 cfs (cubic feet per second)
 - 7-Q₂ = 1740 cfs
 - 90-Q₁₀ = 1590 cfs
 - Harmonic Mean Flow = 2650 cfs
- Hardness = 113 mg/L as CaCO₃. This value represents the geometric mean of data from WET testing from 2018 to 2021.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: a mixing zone of 100% was approved on July 23, 1990 based on discharge directly to the turbine intakes.
- Source of background concentration data: Chloride, mercury, and copper data from the Menominee River at CTH JJ is used for this evaluation. The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations.
- Multiple dischargers: The Marinette Wastewater Utility discharges about 1.4 mi downstream from Kimberly Clark Marinette and Tyco Fire Products and Waupaca Foundry discharge further downstream. Due to the high level of dilution (IWC is less than 1%) overlapping mixing zones from these discharges are not considered in this assessment.
- Impaired water status: This segment of the Menominee River is listed as impaired for mercury and PCBs

Effluent Information

- Flow rates: Outfall 004
 - Max annual average = 1.12 MGD (Million Gallons per Day)
 - Peak daily = 2.86 MGD

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Peak weekly = 2.74 MGD

Peak monthly = 2.25 MGD

For reference, the actual average flow from February 2018 to January 2023 was 0.96 MGD.

No discharge has occurred at Outfall 005 from February 2018 to January 2023. Therefore, the flows and effluent characteristics data of the combined Outfall 003 are treated to be the same as Outfall 004 in this evaluation. Discharge has occurred two days at Outfall 001 during this period, with an average flow of 0.00172 MGD.

- Hardness = 97 mg/L as CaCO₃. This value represents the geometric mean of data from the permit application and WET testing from 2018 to 2021.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: A ZID of 38:1 was approved on July 23, 1990 based on discharge directly to the turbine intakes.
- Water source: Mostly intake from the Menominee River (~96%) with some municipal supply from the City of Marinette (~4%)
- Additives: Two additives are used at Outfall 001 and are not expected to be present in the discharge. Three biocides, 10 water quality conditioners, and two process additives are used at Outfall 004 and all are removed by treatment and not expected to be present in the final discharge. A description of the additives was attached to the permit application.
- Effluent characterization: This facility is categorized as an industrial discharger, so the permit application required effluent sample analyses for all the “priority pollutants” except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code. The permit-required monitoring for mercury and phosphorus from February 2018 January 2023 is used in this evaluation.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled “MEAN EFFL. CONC.”. Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Sample Date	Copper µg/L
06/02/2022	4.4
06/07/2022	<3.4
06/16/2022	5.4
06/21/2022	<3.4
Average	2.5

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

	Mercury ng/L June 2018 to October 2022
1-day P ₉₉	2.59
4-day P ₉₉	1.61
30-day P ₉₉	1.12
Mean	0.89
Std	0.49
Sample size	19
Range	0.314 - 1.86

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The following table presents the average concentrations and loadings at Outfall 004 and the calculated Outfall 003 from February 2018 to January 2023 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD ₅		189 lbs/day
TSS		210 lbs/day
pH field	6.58 s.u.	

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

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

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

Daily Maximum Limit Calculation Method

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. In accordance with s. NR 106.06(3)(b), limitations based on acute toxicity are either set equal to two times the acute criteria (the final acute value) or calculated using the mass balance equation below, whichever is more restrictive.

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

Where:

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

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

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

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

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

In this case, limits set equal to two times the acute criteria are more restrictive and this method is used to calculate the daily maximum limits shown in the table below.

The following tables list the calculated WQBELs for this discharge along with the results of effluent

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sampling for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

ZID = 38:1

SUBSTANCE	REF. HARD. mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT*	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P ₉₉	1-day MAX. CONC.
Copper	97	15.0	0.63	547.6	109.5	2.45		
Mercury (ng/L)		830	2.82	31433			2.59	1.86
Chloride (mg/L)		757	7.3	28489	5698	33.2		

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

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 1240 cfs (100% of the 7-Q₁₀), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

SUBSTANCE	REF. HARD. mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P ₉₉
Copper	113	11.52	0.63	7777	1555	2.45	
Mercury (ng/L)		440	2.82	312191			1.61
Chloride (mg/L)		395	7.3	276862	55372.4	33.2	

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 1590 cfs 100% of the 90-Q₁₀), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P ₉₉
4,4'-DDT	0.0110		10.072	2.014	0.49	
Mercury (ng/L)	1.3	2.82	1.30			1.12

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 2650 cfs (100% of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Cyanide, Total	9300		14192210	2838442	14.2
4,4'-DDT	0.003		4.578	0.916	0.49

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 2650 cfs (100% of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Chloroform	1960		2991046	598209	24

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

Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, **effluent limitations are not required for any toxic substances.**

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the Menominee River is known to exceed 1.3 ng/L. The 30-day P₉₉ of effluent data collected from 2018 to 2022 is 1.12 ng/L and there is no reasonable potential to exceed the applicable mercury limit. **No limit is required but continued mercury monitoring is recommended.**

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 <0.113 ng/L and a PFOA result of 0.236 ng/L. These results are less than one fifth of the respective criteria for each substance. Based on the discharge category and known levels of PFOS/PFOA in the source water, **PFOS and PFOA monitoring is recommended at a monthly frequency.**

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

The State of Wisconsin promulgated revised water quality standards for ammonia nitrogen in ch. NR 105, Wis. Adm. Code, effective March 1, 2004 which includes criteria based on both acute and chronic toxicity to aquatic life. Given the fact that the Kimberly Clark Marinette does not currently have ammonia nitrogen limits, the need for limits is evaluated at this time.

Four samples for ammonia nitrogen were taken February 2018 to January 2023, and their results were as follows:

Ammonia Nitrogen Effluent Data

Sample Date	Ammonia Nitrogen mg/L
6/2/22	<0.14
6/7/22	<0.14
6/16/22	<0.14
6/21/22	<0.14

These results are well below the lowest ammonia limits that would be calculated. Therefore, **no ammonia limits or monitoring are recommended in the reissued permit.**

PART 4 – PHOSPHORUS

Technology-Based Effluent Limit

Subchapter II of Chapter NR 217, Wis. Adm. Code, requires industrial facilities that discharge greater than 60 pounds of Total Phosphorus per month to comply with a 12-month rolling average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Kimberly Clark Marinette does not currently have an existing technology-based limit, the need for this limit in the reissued permit is evaluated. The data demonstrates that the annual monthly average phosphorus loading is less than 60 lbs/month, which is the threshold for industrial facilities in accordance to s. NR 217.04(1)(a)2, Wis. Adm. Code, and therefore **no technology-based limit is required**.

Annual Average Mass Total Phosphorus Loading

Month	Monthly Avg. mg/L	Total Flow MG/month	Total Phosphorus lb./mo.
March 2020	0.08	23.30	15.5
April 2020	0.12	23.61	23.6
August 2020	0.015	34.67	4.3
November 2020	0.051	23.23	9.9
January 2021	0.092	26.65	20.5
June 2021	0.06	43.60	21.8
August 2021	0.12	57.99	58.0
October 2021	0.11	30.31	27.8
March 2022	0.11	23.34	21.4
June 2022	0.081	31.91	21.4
July 2022	0.087	35.54	25.9
August 2022	0.10	41.72	33.7
October 2022	0.068	23.38	13.3
Average =			22.9

Total P (lbs/month) = Monthly average (mg/L) × total flow (MG/month) × 8.34 (lbs/gallon)
 Where total flow is the sum of the actual (not design) flow (in MGD) for that month

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

Water Quality-Based Effluent Limits (WQBEL)

Revisions to administrative rules regulating phosphorus took effect on December 1, 2010. These rule revisions include additions to s. NR 102.06, Wis. Adm. Code, which establish phosphorus standards for surface waters. Subchapter III of NR 217, Wis. Adm. Code, establishes procedures for determining WQBELs for phosphorus, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

Section NR 102.06(3)(a), Wis. Adm. Code, specifically names river segments for which a phosphorus criterion of 0.100 mg/L applies. For other stream segments that are not specified in s. NR 102.06(3)(a), Wis. Adm. Code, s. NR 102.06(3)(b), Wis. Adm. Code, specifies a phosphorus criterion of 0.075 mg/L. The phosphorus criterion of 0.100 mg/L applies for the Menominee River.

The conservation of mass equation is described in s. NR 217.13(2)(a), Wis. Adm. Code, for phosphorus WQBELs and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream phosphorus concentrations (Cs) provided below.

$$\text{Limitation} = [(WQC)(Qs + (1-f) Qe) - (Qs - f Qe) (Cs)] / Qe$$

Where:

- WQC = 0.100 mg/L for the Menominee River.
- Qs = 100% of the 7-Q₂ of 1740 cfs
- Cs = background concentration of phosphorus in the receiving water pursuant to s. NR 217.13(2)(d), Wis. Adm. Code
- Qe = effluent flow rate = 1.12 MGD = 1.74 cfs
- f = the fraction of effluent withdrawn from the receiving water = 0.96

Section NR 217.13(2)(d), Wis. Adm. Code, specifies that the background phosphorus concentration used in the limit calculation formula shall be calculated as a median using the procedures specified in s. NR 102.07(1)(b) to (c), Wis. Code. All representative data from the most recent 5 years shall be used, but data from the most recent 10 years may be used if representative of current conditions.

A previous evaluation resulted in a WQBEL of 69 mg/L using a background concentration of 0.030 mg/L. Section NR 217.13(2)(d), Wis. Adm. Code, states that the determination of upstream concentrations shall be evaluated at each permit reissuance.

A review of all available in stream total phosphorus data from SWIMS station 383016 on the Menominee River at Hwy 41 in Marinette stored in the Surface Water Integrated Monitoring System database indicates the median background total phosphorus concentration near the point of discharge is 0.022 mg/L.

Substituting a median value of 0.022 mg/L into the limit calculation equation above, the calculated limit is 75 mg/L.

Effluent Data

The following table summarizes effluent total phosphorus monitoring data from February 2018 to January 2023.

Total Phosphorus Effluent Data

	Phosphorus mg/L
1-day P ₉₉	0.17
4-day P ₉₉	0.14
30-day P ₉₉	0.094
Mean	0.074
Std	0.028
Sample size	30
Range	0.015 - 0.15

Reasonable Potential Determination

The discharge does not have reasonable potential to cause or contribute to an exceedance of the water quality criterion because the 30-day P₉₉ of reported effluent total phosphorus data is less than the calculated WQBEL. Therefore, **a WQBEL is not required.**

**PART 5 – WATER QUALITY-BASED EFFLUENT LIMITATIONS
FOR THERMAL**

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

Due to the amount of upstream flow available for dilution in the limit calculation ($Q_s:Q_e >20:1$), the lowest calculated limitation is 120° F (s. NR 106.55(6)(a), Wis. Adm. Code).

The table below summarizes the maximum temperatures reported during monitoring from October 2015 to September 2016 since no temperature data has been collected in the current permit term.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(°F)
JAN	72	76	-	120
FEB	72	79	-	120
MAR	76	83	-	120
APR	85	86	-	120
MAY	86	89	-	120
JUN	94	96	-	120
JUL	96	100	-	120
AUG	96	98	-	120
SEP	91	94	-	120
OCT	84	90	-	120
NOV	82	85	-	120
DEC	72	77	-	120

Reasonable Potential

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

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

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- (a) The highest weekly average effluent temperature for the month.
- (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Based on the available effluent data **no effluent limits are recommended for temperature. However, temperature monitoring is recommended.**

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

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

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- A zone of initial dilution (ZID) has been approved for this discharge, according to the requirements set forth in s. NR 106.06(3)(c), Wis. Adm. Code. To assure that the discharge from Outfall 004 is not acutely toxic to organisms at the edge of the mixing zone, WET tests must produce a statistically valid LC₅₀ (Lethal Concentration) greater than the acute mixing zone (AMZ) concentration. The AMZ of 9% shown in the WET Checklist summary below was calculated according to the following equation:

$$\begin{aligned} \text{AMZ (as \%)} &= (100 / Q_e + Q_s \text{ ratio}) \times 3.3 \\ &= 100/38 \times 3.3 \\ &= 9\% \end{aligned}$$

Where “Q_e + Q_s ratio” is the ratio of the receiving water after it has mixed with the effluent compared to the effluent alone. For example, a ratio expressed as 19.5 (or 19.5:1) means that 18.5 parts receiving water is mixing with 1-part effluent.

- Chronic testing is usually not recommended where the ratio of the 7-Q₁₀ to the effluent flow exceeds 100:1. For Kimberly Clark Marinette, that ratio is approximately 714:1. With this amount of dilution, there is believed to be little potential for chronic toxicity effects in the Menominee River associated with the discharge from the Kimberly Clark Marinette, so the need for chronic WET testing will not be considered further.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 004 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known

discharge. The specific receiving water location must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 004. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations. Significant changes were made to WET test methods in 2004 and these changes were assumed to be fully implemented by certified labs by no later than June 2005. Testing from prior to June 2005 is excluded from this evaluation.

WET Data History

Date Test Initiated	Acute Results LC ₅₀ %				Comments and Footnotes
	<i>C. dubia</i>	Fathead minnow	Pass or Fail?	Used in RP?	
09/14/2005	>100	>100	Pass	Yes	
11/01/2006	>100	>100	Pass	Yes	
04/18/2007	>100	>100	Pass	Yes	
01/16/2008	77.1	>100	Pass	Yes	
05/25/2011	>100	>100	Pass	No	1
08/31/2011	>100	>100	Pass	Yes	
10/30/2013	>100	>100	Pass	Yes	
05/20/2014	>100	>100	Pass	Yes	
02/24/2015	>100	>100	Pass	Yes	
10/13/2015	>100	>100	Pass	Yes	
06/01/2016	>100	>100	Pass	Yes	
08/30/2016	77.7	>100	Pass	Yes	
02/14/2017	>100	>100	Pass	Yes	
12/05/2017	>100	>100	Pass	Yes	
12/27/2018	>100	>100	Pass	Yes	
08/28/2019	>100	>100	Pass	Yes	
05/13/2020	>100	>100	Pass	Yes	
02/10/2021	>100	>100	Pass	Yes	
11/30/2022	>100	69.5	Pass	Yes	

Footnotes:

1. *Qualified or Inconclusive Data.* Data quality concerns were noted during testing which calls into question the reliability of the test results. Test was restarted on 8/31/2011
- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

Acute Reasonable Potential = [(TUa effluent) (B)(AMZ)]

Attachment #1

Acute WET Limit Parameters

TUa (maximum) 100/LC ₅₀	B (multiplication factor from s. NR 106.08(5)(c), Wis. Adm. Code, Table 4)	AMZ
100/69.5 = 1.44 TUa	3.0 Based on 3 detects	9%

$$[(TUa \text{ effluent}) (B)(AMZ)] = 0.39 < 1.0$$

Therefore, **reasonable potential is not shown for an acute WET limit** using the procedures in s. NR 106.08(6) and representative data from 2005 to 2022.

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

WET Checklist Summary

	Acute
AMZ/IWC	AMZ = 9%. 0 Points
Historical Data	3 detect tests used to calculate RP. 0 Points
Effluent Variability	Little variability, no violations or upsets involving the surface water discharge, consistent WWTF operations. 0 Points
Receiving Water Classification	WWSF 5 Points
Chemical-Specific Data	Reasonable potential for limits for zero substances based on ATC. Copper, mercury, and chloride detected. Additional Compounds of Concern: 4,4 DDT and chloroform 5 Points
Additives	3 Biocides and 10 Water Quality Conditioners added. Phosphorus removal chemicals not in use 19 Points
Discharge	Pulp and Paper

Attachment #1

	Acute
Category	15 Points
Wastewater Treatment	Secondary Treatment 0 Points
Downstream Impacts	No impacts known 0 Points
Total Checklist Points:	44 Points
Recommended Monitoring Frequency (from Checklist):	1x yearly
Limit Required?	No
TRE Recommended? (from Checklist)	No

After consideration of the guidance provided in the Department's WET Program Guidance Document (2022) and other information described above, **annual acute WET tests are recommended in the reissued permit**. A minimum of annual monitoring would be recommended because Kimberly Clark Marinette is a primary industry. 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).

Attachment #2

