

PERMIT FACT SHEET

General Information

Permit Number:	WI-0044938-07-0
Permit Name:	Noncontact Cooling Water and/or Boiler Water Blowdown
Permittee:	Point source dischargers in the state of Wisconsin
Discharge Location:	Surface waters and/or wetlands in the state of Wisconsin
Receiving Water:	Surface waters and/or wetlands in the state of Wisconsin

WPDES Permit Program Background

Chapter 283 of Wisconsin Statutes requires a Wisconsin Pollutant Discharge Elimination System (WPDES) permit for the discharge of any pollutant through a point source into any waters of the state which includes surface waters and groundwater. WPDES permits are issued by the Wisconsin Department of Natural Resources (department) consistent with applicable federal requirements. These permits contain requirements that include pollutant discharge limitations, monitoring and reporting or record keeping requirements, best management practices (BMPs) and other provisions to reduce, eliminate, or minimize the risk of pollutants impacting human health and water quality.

A WPDES permit is an allowance for a facility to discharge a specified amount of a pollutant into the waters of the state under specific conditions. There are two basic types of WPDES permits:

- **Individual permit.** An individual permit is a permit specifically tailored to an individual facility. Once a facility submits a complete application(s), the department develops a draft permit for that facility based on the information contained in the permit application (e.g., type of activity, nature of discharge, receiving water quality). After a public participation process, the department may issue the permit to the facility for a specific time period (not to exceed five years) with a requirement that the facility reapply 180 days prior to the expiration date. Public notices are posted for each individual permit application and proposed individual permit permittee.
- **General Permit.** A general permit covers a group or category of dischargers with similar qualities within a designated area of the state under one WPDES permit. A general permit provides coverage to multiple dischargers. To obtain coverage under a general permit for a discharge of pollutants, an owner or operator must submit a notice of intent (NOI) requesting general permit coverage. General permits have an effective term of 5 years from the date of issuance. If a permittee submitted a complete and timely NOI to be covered by the general permit and the department grants coverage under the general permit, the discharge of pollutants is then subject

to all conditions of the general permit, and these terms or conditions shall continue to apply until the effective date of the reissued general permit. Public notices are issued for the general permit and not for the permittee covered under the general permit. A person may apply for general permit coverage at the time a general permit is issued, or during the term of the permit.

General Permit Objective

This general permit was created to properly manage discharges from non-residential facilities with non-contact cooling water, noncontact condensates, and boiler blowdown and bleed-off discharges that are discharged directly to surface waters, including wetlands, to protect public health and water quality of surface water within the state of Wisconsin.

General Permit Description

Section NR 205.08, Wis. Adm. Code, authorizes the department to issue a general permit applicable to a designated area of the state authorizing discharges from specified categories or classes of point sources located within that area if they (1) perform the same or substantially similar operations; (2) produce the same types of wastewater streams; (3) employ the same or substantially similar wastewater treatment operations to control specific pollutants; (4) are subject to the same effluent limitations and monitoring requirements; and (5) in the opinion of the department, are more appropriately controlled under a general permit than under individual permits.

Some permittees covered under this general permit will have limits and monitoring requirements for temperature, phosphorus, and chlorine, among other parameters. This may be due to the additives within their effluent stream, additives within their water supply, or effluent stream characteristics. It may be advisable for facilities to consider discharging to the sanitary sewer in these cases. Facilities must obtain authorization from the servicing publicly owned treatment works prior to discharging new wastewater sources to the sanitary sewer. All additives must be reviewed and may be approved on a case-by-case basis. Information on the water treatment additive review process is available on the department's additives webpage: [Additives webpage](https://dnr.wisconsin.gov/topic/Wastewater/Additives.html) <https://dnr.wisconsin.gov/topic/Wastewater/Additives.html>.

The following describes the categories and operations covered under this general permit.

Noncontact Cooling Water (NCCW): This permit is applicable for NCCW water used for cooling which does not come into contact with any raw material, intermediate or finished product, or waste and has been used in heat exchangers or other cooling means where contamination with process waste is not normally expected. It includes once-through cooling water for processes such as air compressors and welders.

Note: NCCW discharges to surface waters or wetlands may be eligible for coverage under this permit. NCCW discharges to groundwater are more appropriately covered under the WPDES Low Impact Discharge General Permit WI-0066575.

Boiler Blowdown (BBD) and Bleed-off: This permit is applicable for BBD and bleed-off water (the terms are interchangeable) resulting from the controlled removal of water

from a boiler system to manage the concentration of impurities (dissolved and suspended solids). These discharges may be both intermittent and continuous. All boilers have discharge connections at low points for short duration intermittent removal of settled sludge (blowdown). Frequent blowdown may be necessary to meet the total suspended solids (TSS) limit included in this permit. Many boilers also have discharge connections located just below the water level in the steam release area for continuous removal of dissolved solids (bleed-off). Continuous blowdown and/or bleed-off of a small amount of boiler water can allow for better operation by providing more consistent control of boiler water chemistry and chemical additives. Chemicals are added to boiler water to control scale and corrosion and provide a good quality steam. While most boiler water additives are non-toxic, every additive needs to be reviewed and approved. Information on the water treatment additive review process is available on the department's additives webpage: [Additives Information](https://dnr.wisconsin.gov/topic/Wastewater/Additives.html)
<https://dnr.wisconsin.gov/topic/Wastewater/Additives.html>

Note: BBD and/or bleed-off discharges to surface waters may be eligible for coverage under this permit. BBD and/or bleed-off discharges to groundwater are more appropriately covered under the WPDES Low Impact Discharge General Permit WI-0066575.

Condensation: This permit is applicable for some industrial processes that produce a discharge of condensation through the cooling of hot water vapor changing from gas back into a liquid. Condensation, excluding those exclusively from air compressors and air conditioners, may be regulated under this general permit if not already authorized under another general permit. If air compressor and air conditioner condensation are combined with any permitted NCCW, condensate, BBD/bleed off, reverse osmosis permeate and/or other similar discharges, they may also be regulated under this permit. All additives must be reviewed and approved prior to determining if a discharge is eligible under this permit.

Note: Condensation to surface waters may be eligible for coverage under this permit. Discharges of uncontaminated condensation exclusively from air compressors and/or air conditioners to surface water and permitted condensation to groundwater are more appropriately covered under the WPDES Low Impact Discharge General Permit WI-0066575.

Reverse Osmosis (RO) Permeate: A reverse osmosis system forces a liquid through semi-permeable membrane(s) separating water from impurities. The filtered liquid is called permeate and the impurities collected by the filters are the concentrate. The discharge of concentrate is not eligible for this permit. On a case-by-case basis RO permeate may be covered under this permit; however, the permeate stream and/or any condensate of whey (COW) recovered from the dairy industry are not eligible for this permit.

Note: Depending on the source of the liquid subjected to the RO process, the resulting permeate discharges may be more appropriately covered under a WPDES individual permit. If the source liquid is uncontaminated well or drinking supply water, then coverage may be provided under the WPDES Water Treatment and Conditioning General Permit WI-0046540.

Other Similar Discharges: Other similar discharges may be covered by the general permit if expressly approved in writing by the department. This would include discharges that produce effluent quality similar to NCCW discharges, such as geothermal discharges.

General Permit Summary

This general permit establishes applicability criteria, application for permit coverage requirements, wastewater discharge requirements, and standard requirements for facilities with discharges from non-contact cooling water, condensates, boiler water (blow-down and bleed-off), and reverse osmosis permeate. The permit requirements are provided to protect human health and protect and maintain the physical, chemical, and biological integrity of waters of the state by eliminating or minimizing the discharge of pollutants.

Fact Sheet Organization

This fact sheet explains the rationale and assumptions used in deriving the conditions and requirements set forth in the general permit. Additionally, this fact sheet highlights changes in permit conditions that the department proposes to make when reissuing the Noncontact Cooling Water or Condensate and Boiler Water WPDES permit. This fact sheet compares conditions in the previous general permit to those in the reissued permit. There are multiple changes within the permit that will not be highlighted that have been made to comply with federal Title II of the Americans with Disabilities Act (ADA) accessibility requirements.

1 Applicability Criteria

Explanation of Applicability Criteria

According to ss. NR 205.08(2) and NR 216.003(1), Wis. Adm. Code, the department may include applicability criteria in general permits. Additionally, according to 40 CFR 122.28(a)(4)(ii), general permits may exclude specified sources or areas from coverage. Sections below explain the rationale and assumptions used in deriving the applicability criteria for this general permit.

1.1 Wastewater Discharge Activities Covered

In accordance with s. NR 205.08(1), Wis. Adm. Code, the department may issue general WPDES permits applicable to designated areas of the state authorizing wastewater discharges from specified categories or classes of point sources located within those areas. Therefore, the department created this general permit, and it is applicable to non-residential facilities within the state of Wisconsin that result in discharges of noncontact cooling water, boiler blow-down and bleed-off, reverse osmosis permeate (excluding COW water or uncontaminated groundwater well or drinking water supply), condensates (air compressor and air conditioning condensate only when combined with other discharges covered under this permit), or other similar wastewaters that are discharged to surface waters. The department may require other similar discharges to meet the requirements of this general permit if the department finds that the general discharge in question is innocuous.

Lastly, the permittee must submit a complete and timely Notice of Intent (NOI) to the department in accordance with Permit Section 2 and then the permittee will receive a letter from the department granting them coverage under this general permit.

1.2 Discharge Activities Not Covered

Changes from Previous Permit

The discharge activities that are not eligible for coverage under this permit are listed in Permit Section 1.2. This list has been expanded to clearly define all discharges that are not applicable under this permit. The following discharge activities were added and/or relocated to the discharge activities not covered:

- Discharges to groundwater are no longer eligible under this permit and may be more appropriately covered under the WPDES Low Impact Discharge General Permit WI-0066575.
- Discharges to a lake, impoundment, river and/or Great Lake directly or via storm sewer or connected wetland with effluent flows greater than those listed in permit Tables 1a and 1b were added to protect surface water quality.

Table 1a applies for dischargers that are covered by the NCCW GP or other WPDES permits prior to January 1, 2027. The flows in the table are maximum effluent flow rates and were calculated to result in temperature effluent limitations equal to or greater than 120 °F using the equation in s. NR 106.55(7) Wis. Adm. Code for dischargers to inland lakes, impoundments and Great Lakes waters. Effluent flow rates higher than those in the table may require a WPDES individual

permit with temperature effluent limitations to ensure compliance with thermal water quality standards.

Table 1b applies to new discharges that commence after January 1, 2027. The flows in this table were calculated using similar procedures as Table 1a and are the maximum allowable flow rates for new dischargers in order to prevent significant lowering of water quality consistent with the requirements in ch. NR 207 Wis. Adm. Code.

- Discharges of process water now include condensate of whey (COW). Process water remains ineligible under this permit and may need to be covered under a WPDES individual permit.
 - Discharges consisting solely of air compressor or air conditioning condensates are no longer eligible under this permit and may be more appropriately covered under the WPDES Low Impact Discharge General Permit WI-0066575.
 - Ineligibility of discharges of air compressor condensate contaminated with oil and grease have been removed because all discharges must meet permit limits.
 - Discharges to a geographically isolated wetland that does not have a direct or permanent surface water connection to navigable lakes or rivers may not be covered under this permit as they are variable and require calculation of limits beyond the scope of this permit. Discharges to isolated wetlands may need to be covered under a WPDES individual permit;
 - Discharges containing domestic or municipal wastewater were not eligible under the prior permit but have been added for clarity and consistency with other WPDES general permits;
 - Discharges containing water treatment additives where the use is not approved in writing by the department were considered ineligible in the prior permit. This has been added for clarity and consistency with other WPDES general permits;
 - Any new or increased discharge where the permittee does not have treatment required to maintain levels sufficient to meet the effluent limitations cannot be covered under this general permit;
- (1) Discharges of pollutants not authorized under this permit in quantities that exceed water quality standards was expanded to include any new or increased discharge that results in the significant lowering of water quality in waters designated as fish and aquatic life communities identified in s. NR 102.04(3) Wis. Adm. Code, Great Lakes system waters identified in NR 102.12, and variance waters identified within ss. NR 104.05 through 104.10, Wis. Adm. Code;
- Discharges that will contain a pollutant of concern that will contribute to the impairment of a 303(d) listed impaired water or be in noncompliance with an approved Total Daily Maximum Load (TMDL) were not listed in the prior permit but were considered ineligible. This has been added for clarity and consistency with other WPDES general permits;

- Discharges containing toxic or hazardous pollutants required to be reported under ch. NR 706, Wis. Adm. Code were not listed in the prior permit but were considered ineligible. This has been added for clarity and consistency with other WPDES general permits;
 - Discharges that will adversely impact endangered and threatened species, including causing an incidental take of any species that are federally listed as endangered and threatened under the Endangered Species Act has been updated. These discharges may occur if the department determines that the discharges comply with the endangered and threatened resource protection requirements of s. 29.604, Wis. Stats., and ch. NR 27, Wis. Adm. Code;
 - Discharges that will adversely affect any historic property that is listed, or on the inventory or on the list of locally designated historic places under s. 44.45, Wis. Stats., unless the department determines that the discharges will not have an adverse effect on any historic property pursuant to s. 44.40(3), Wis. Stats were not listed in the prior permit but were considered ineligible. This has been added for clarity and consistency with other WPDES general permits;
- (2) Discharge within Indian Country was listed in the previous permit but was updated to add clarity and consistency with other WPDES general permits;
- Discharges of wastewater from any accidental or unplanned release, spill, leak, or overflow were not listed in the prior permit but are prohibited by State and Federal law and are not authorized under this general permit. This prohibition has been added for clarity and consistency with other WPDES general permits.

Explanation of Discharge Activities Not Covered

In accordance with s. NR 205.08(5), Wis. Adm. Code, the department may deny coverage or revoke coverage under this permit and issue an individual WPDES permit to a facility if the department determines that discharges are more appropriately covered under an alternative general or individual WPDES permit. The discharge activities listed in Permit Section 1.2 are not applicable to this general permit and may require application under another general or individual WPDES permit and have been added to maintain consistency with Wisconsin Administrative Codes and Statutes and other WPDES general permits and to improve requirement clarity in this general permit.

Groundwater: Discharges to groundwater were previously covered by this general permit. In preparation for this reissuance all discharge types were reevaluated. This process determined that discharges to groundwater may be more applicable under the WPDES Low Impact Discharge General Permit WI-0066575 or an WPDES individual permit. The volume of discharge and any additives used will be reviewed to determine which permit will be needed to protect groundwater quality requirements found in ch. NR 140 Wis. Adm. Code.

Unapproved Water Treatment Additives: The discharge shall not contain a water treatment additive where the additive use is not approved in writing by the department. Many additives are toxic at certain rates to fish and aquatic life and require approval by the department prior to initiating use. Facilities using additives at rates greater than what was approved by the department or discharging wastewater to surface water with

unapproved additives will be in violation of this permit. Chlorine-based compounds, pH adjusters, water treatment additives already present in the water supply system and chemicals added as part of the water treatment process that are expected to remain with the solids and not discharged in the final effluent do not need to be reviewed and approved. Permit Section 5 outlines required submittals and review procedure.

Wetlands: Wastewater discharges to wetlands have been divided into two distinct groups: wetlands directly connected to a lake, impoundment, Great Lake or river and those that are geographically isolated and do not have a direct or permanent connection to a water body. Connected wetlands may be covered under this general permit. Geographically isolated wetlands will need case-by-case examination to determine applicability and limitations which are more appropriately covered under a WPDES individual permit to provide more oversight, monitoring and discharge limitations necessary to protect these waters. The permittee can use the [Surface Water Data Viewer https://dnr.wisconsin.gov/topic/SurfaceWater/swdv](https://dnr.wisconsin.gov/topic/SurfaceWater/swdv) to identify mapped wetlands in the county that the discharge will occur. Discharges covered under this permit shall meet the wetland protection requirements of ch. NR 103, Wis. Adm. Code, and shall not adversely impact wetlands in accordance with s. NR 106.61(1)(b), Wis. Adm. Code. For discharges that impact wetlands, a facility will need to submit information so the department can determine if a discharge meets code requirements as described in Permit Section 6.4

Outstanding and Exceptional Resource Waters: Wastewater discharges to outstanding and exceptional resource waters in ch. NR 102, Wis. Adm. Code, or discharges that would lower the water quality of downstream outstanding and exceptional water resources are not authorized by this permit. Regulation of discharges to outstanding and exceptional resource waters requires an individual permit which provides the oversight, monitoring and discharge limitations necessary to protect these types of receiving waters. The permittee can use the [Surface Water Data Viewer https://dnr.wisconsin.gov/topic/SurfaceWater/swdv](https://dnr.wisconsin.gov/topic/SurfaceWater/swdv) to identify the outstanding and exceptional resource waters in the county that the discharge will occur.

Capability to Meet Limits: Any new or increased discharge of wastewater where the permittee is found to not have the capability to treat any proposed new or increased discharge and maintain treatment levels sufficient to meet the effluent limitations found herein is not authorized under this general permit. The department requires that the applicant apply for coverage under an individual permit. The discharge will then be evaluated by the department under the antidegradation requirements of ch. NR 207, Wis. Adm. Code. The department may suggest that applicants evaluate a variety of options to ensure no significant lowering of water quality occurs in the receiving water.

Significant Lowering of Water Quality: In a case where a proposed new or increased discharge would result in the significant lowering of water quality in waters designated as fish and aquatic life communities identified in s. NR 102.04(3), Wis. Adm. Code, and Great Lakes waters system identified in NR 104.05 through NR 104.10, the discharge would not be authorized under this permit. Permit Section 1.2 Tables 1a and 1b display total effluent flow thresholds based on the location of a lake, impoundment or Great Lake and the location of the outfall, along the shoreline, offshore on lakebed or in a harbor. Facilities above the threshold will be required to apply for a WPDES individual

permit which will provide more oversight, monitoring and discharge limitations necessary to protect these waters. New or increased discharges that meet threshold requirements will then be evaluated by the department under the antidegradation requirements of chs. NR 102.045 and 207, Wis. Adm. Code (see Permit Section 6.1) before approval for coverage under this general permit can be given.

Impaired Waters and TMDLs: This general permit is not applicable to discharges that will contain a pollutant of concern that will contribute to the impairment of a 303(d) listed impaired water that does not have a federally approved Total Daily Maximum Load (TMDL) for the pollutant of concern; or if there is a federally approved TMDL for the listed waterbody, be inconsistent with the wasteload allocations for general permits in the federally approved TMDL. Regulation of pollutants of concern to impaired waters that do not have a federally approved TMDL or waters with a federally approved TMDL are more appropriately regulated by an individual permit which will provide more oversight, monitoring and discharge limitations necessary to protect these waters. These discharges would be considered a significant contributor of pollution and potentially inconsistent with state water quality standards. See Permit Section 6.3 for details.

Hazardous Substances: Discharges of hazardous substances that are required to be reported under ch. NR 706, Wis. Adm. Code are not authorized by this permit. Exemptions for discharge of these substances require an individual permit which provides the oversight, monitoring and discharge limitations necessary to protect receiving waters. Section 292.11(2)(a), Wis. Stats. Code requires any person who possesses or controls a hazardous substance or who causes the discharge of a hazardous substance to notify the department of Natural Resources **immediately** of any discharge not authorized by the permit.

Endangered and Threatened Resources: Discharges that affect endangered and threatened resources are not eligible for this permit, unless the department determines that the discharges comply with the endangered and threatened resource protection requirements of s. 29.604, Wis. Stats., and ch. NR 27, Wis. Adm. Code. Facilities with discharges that require more oversight to ensure that they do not violate these protection requirements may need to be covered by an individual permit. If the permittee has reason to believe that endangered and threatened resources will be impacted, then further Wisconsin Natural Heritage Inventory (NHI) screening should be conducted by the permittee. Please contact the [Endangered Resources Review Program](http://dnr.wi.gov/topic/ERReview/) <http://dnr.wi.gov/topic/ERReview/> if you need information about whether a proposed project may impact rare species or other sensitive resources.

Historical Properties: Discharges that will adversely affect any historic property that is listed, or on the inventory or on the list of locally designated historic places under s. 44.45, Wis. Stats., are not eligible for this permit, unless the department determines that the discharges will not have an adverse effect on any historic property pursuant to s. 44.40(3), Wis. Stats. The department is required by law to review the project for historic preservation compliance. Please contact the department archaeologist with any questions.

Discharges within Indian Country: The USEPA is the permitting authority for the NPDES program in Indian Country. If your facility is located in Indian Country, then USEPA has the jurisdiction to regulate the discharge from your facility, and you must apply to the USEPA for coverage.

Surface Water Standards: The discharges from facilities eligible for this permit shall not have a reasonable potential to exceed any applicable surface water standards. This includes any other applicable surface water quality standards downstream of the discharge (i.e., tribal or other states). Facilities with discharges that have a reasonable potential (as specified in ch. NR 106, Wis. Adm. Code) to violate any applicable surface water quality standards would normally require the increased oversight, monitoring and water quality limitations found in a site-specific individual permit.

1.3 Permit Exclusions

Changes from Previous Permit

Permit Section 1.3 has been added to clarify discharge activities excluded from required coverage under a WPDES permit.

Holding Tanks: In accordance with s. NR 200.03(2)(a), Wis. Adm. Code, any portion of the wastewater directed to a holding tank then pumped and hauled to publicly owned treatment works (POTW) is excluded under this general permit as the POTW already has a WPDES general permit.

Publicly Owned Treatment Works: In accordance with s. NR 200.03(2)(a), Wis. Adm. Code, any portion of the wastewater directed to a sanitary sewer system that conveys the wastewater to a publicly owned wastewater treatment works (POTW) is excluded under this general permit as the POTW already has a WPDES permit. This general permit applies only to direct discharges to Waters of the State. Direct discharges include discharges to storm sewers or other conveyances to a surface water (such as swales, ditches, and sloped land).

Department Approved Storage Facility: Any treatment structure or lagoon must follow the design criteria under ch. NR 213, Wis. Adm. Code.

2 Application for Permit Coverage

Changes from Previous Permit

This section has been revised from the previous permit to contain updated application requirements. Sections 5.2 and 5.3 from the previous permit have been revised; however, original elements from the previous permit are contained in Section 2 of this permit. Significant changes from the previous permit include:

- Any new applicant proposing a new or existing discharge that was not previously covered under this general permit shall submit a complete electronic Notice of Intent (eNOI) using the online ePermitting System for coverage at least **30 days** prior to discharging to a water of the state in accordance ss. NR 205.08(3) and NR 216.22(2), Wis. Adm. Code.
- Any new or existing permittee shall submit a complete eNOI using the online ePermitting System 30 days prior to January 1, 2027, to continue coverage.
- All eNOIs shall provide all information identified and include the following attachments: a site map, flow diagram for all waste generated and a Water Quality Additive Review Worksheet with a Safety Data Sheet (SDS) for each water treatment additive.
- All eNOIs shall be certified true, accurate and completed electronically by a duly authorized representative as specified in s. 283.37(3), Wis Stats., or an individual that has been delegated signature authority pursuant to s. NR 205.07(1)(g)2., Wis. Adm. Code.
- Any incomplete eNOI will have 30 days from notification to supply missing information.
- All coverage decisions of eligibility or ineligibility of coverage including coverage letters, reissuance letters or WPDES individual permit application information will be transmitted to the Permittee via electronic mail (e-mail). Hard copies of the decisions may be mailed to the permittee upon request.

Explanation of Application for Permit Coverage Requirements

The department has retained but revised the permit application requirements in the reissued permit. The permit application requirements specify new applicants and existing permittees will need to submit a complete eNOI for coverage under this general permit. The permit application requirements ensure that all the necessary permittee information and discharge information is properly reported to the department and will help the department determine if a discharge is eligible for the general permit. Data provided will be entered into the department permitting database to facilitate setting up discharge monitoring reports and compliance monitoring that may be required. Also, the permit application requirements have been updated to reflect changes from paper to electronic submittals using the online ePermitting System consistent with the EPA eReporting rule in 40 CFR Part 127.

3 Requirements for All Discharges

Changes from Previous Permit

This section applies to all discharges covered under this permit and has been revised from the previous permit to contain updated requirements to maintain consistency with other WPDES general permits.

- Permittees with a surface water intake must follow the best technology available (BTA) found in Permit Section 1.2.23, which corresponds to Permit Section 1.2.12 in the previous permit issuance.

Explanation of Requirements for All Discharges

Surface Water Intake – Facilities with cooling water intake structures which withdraw less than 2 MGD from a surface water or use less than 25% of withdrawn water exclusively for cooling may be covered by this general permit, if they meet certain eligibility requirements. These eligibility requirements include having a maximum design or actual intake velocity of 0.5 feet per second and withdrawing less than 5% of the mean annual river flow or avoiding disruption of the natural thermal stratification of a lake. Facilities can also qualify for this general permit if they operate only for short periods of the year (not during spawning periods) or if they operate a closed cycle system with a minimum of 3 cycles of concentration per day.

For facilities that fall below either of these thresholds (below 2 MGD withdrawn or less than 25% used for cooling), the department is required to make BTA determinations using their best professional judgment, according to 40 CFR 125.90(b). The department believes that facilities which fall below these criteria, and that meet the eligibility criteria described above, pose low to no risk for causing an adverse environmental impact; therefore, in the absence of other site-specific factors that cause concern, a determination can be made that BTA is present at these locations. This general permit can cover facilities that have cooling water intake structures that meet these conditions. The department recognizes that these are conservative assumptions, and that some facilities that meet some, but not all, of these requirements might also pose a low environmental risk. These facilities require additional analyses to confirm their environmental concern on a case-by-case basis and must be covered under an individual WPDES permit.

4 Surface Water Discharge Requirements

4.1 Sampling Points

Changes from Previous Permit

The previous permit did not contain sample point designations. A new numbering system specific to each category of wastewater discharge eligible under this general permit has been added as Permit Section 4.1 to align with the structure and formatting found in other WPDES permits. Shaded text and cells within the table indicate permit conditions that are new or different from those found in the previous permit.

Sampling Point Designation	
Sampling Point Number	Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
001	Sampling Point 001 applies to the discharge of non-contact cooling waters. Samples collected in compliance with the monitoring requirements specified below shall be taken at each discharge location (outfall) following any applicable treatment and prior to discharge to surface water. The permittee shall sample the wastewater at a point and in a manner that will yield representative results of the wastewater that may enter surface water via Outfall 001. Sampling is only required when wastewater is being discharged during the reporting frequency.
002	Sampling Point 002 applies to the discharge of boiler water (blowdown and bleed-off). Samples collected in compliance with the monitoring requirements specified below shall be taken at each discharge location (outfall) following any applicable treatment and prior to discharge to surface water. The permittee shall sample the wastewater at a point and in a manner that will yield representative results of the wastewater that may enter surface water via Outfall 002. Sampling is only required when wastewater is being discharged during the reporting frequency.
003	Sampling Point 003 applies to the discharge of reverse osmosis permeate. Samples collected in compliance with the monitoring requirements specified below shall be taken at each discharge location (outfall) following any applicable treatment and prior to discharge to surface water. The permittee shall sample the wastewater at a point and in a manner that will yield representative results of the wastewater that may enter surface water via Outfall 003. Monitoring is only required when wastewater is being discharged during the sampling frequency.

Sampling Point Designation	
Sampling Point Number	Sampling Point Location, Waste Type/Sample Contents and Treatment Description (as applicable)
004	Sampling Point 004 applies to the discharge of any combination of discharge types as specified in Sampling Point 001-003, combined with condensation (including air compressor and/or air conditioning condensation) non-contact cooling waters, and/or boiler water blowdown and/or bleed-off or other similar discharges. Samples collected in compliance with the monitoring requirements specified below shall be taken at each discharge location (outfall) following any applicable treatment and prior to discharge to surface water. The permittee shall sample the wastewater at a point and in a manner that will yield representative results of the wastewater that may enter surface water via Outfall 004. Sampling is only required when wastewater is being discharged during the reporting frequency.

Explanation of Sampling Points

In accordance with s. NR 218.07, Wis. Adm. Code, the location of sampling points shall be as specified in an applicable permit. The identified sampling points are specified for the permittee to collect representative samples of the discharge after treatment to demonstrate compliance with this general permit. These sampling points are generalized so that it covers all possible discharge situations. The department may state the specific location of sampling points in the coverage letter to the permittee. The department may require relocation of a sampling point if it determines that the existing location does not provide samples representative of the discharge.

4.2 Monitoring Requirements and Effluent Limitations

Changes from Previous Permit

This section has been revised from the previous permit to contain surface water discharge requirements. Section 3 of the previous permit has been revised and original elements from the previous permit are now contained in Section 4.2 of this permit. Shaded text and cells within the table indicate permit conditions that are new or different from those found in the previous permit. Significant changes from the previous permit include:

- The notes have been added for all parameters and incorporated into the table.
- Options for waivers for oil and grease, ammonia and BOD5 have been added to Section 4.
- Options for monitoring reductions or waivers for temperature have been removed this permit term.
- Optimization plan requirements have been relocated from Appendix E and G of the previous permit to Section 4. Numerous changes have been made to the sample frequency and limitations for surface water discharges as follows:
 - A flow estimate is now required daily instead of quarterly.

- Total suspended solids monitoring remains quarterly, except if any sample exceeds 30 mg/L sampling increases to monthly. Some requirements from Appendix E (Phosphorus or TSS limits within U.S. EPA approved TMDL watersheds) of the previous permit have been retained.
- Total phosphorus monitoring has increased from annual to quarterly, and limitations based on the surface water may be required. Requirements from Appendices D and E (Phosphorus limits absent a U.S. EPA approved TMDL and Phosphorus or TSS limits within U.S. EPA approved TMDL watersheds) from the previous permit are no longer applicable, but some original elements have been retained. A new Table 2 has been added to the permit to identify the phosphorus water quality effluent limits based on receiving water type.
- Monitoring and limitations for total residual chlorine and arsenic are required for some facilities. These requirements replace Appendices F and G (Chlorine limitations and Arsenic limitations for direct discharges to the Great Lakes) from the previous permit.
- Monitoring and limitations for temperature are required for all facilities. The monitoring frequency of quarterly has been increased to monthly. These requirements replace Appendices A, B and C (Effluent temperature limits for discharges to limited aquatic life waters and Effluent temperature limits for discharges of high heat) from the previous permit. Tables have been added for temperature limits based on receiving water types (Table 3) and based on receiving water flow to effluent ratio (Tables 4a and 4b).
- The cold shock standard has been added in Section 4.12.2 of this permit.
- Narrative Requirements for Surface Water and Wetlands were referenced in the prior permit and have been enhanced, combined and outlined in Sections 4.13 and 4.14 of this permit to maintain format consistency with other WPDES permits.

4.2.1 Sampling Points (Outfalls) 001, 002, 003 and 004 – Surface Water Discharge Monitoring Requirements and Effluent Limitations

Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Flow Rate	-	Gpd	Daily	Estimate	See Permit Section 4.4
Suspended Solids, Total	Daily Max	40 mg/L	Quarterly	Grab	Applicable if all samples are less than 30.0 mg/L. See Permit Section 4.5, 4.5.1 and 4.5.2
Suspended Solids, Total	Monthly Avg	40 mg/L	Quarterly	Grab	Applicable if all samples are less than 30.0 mg/L. See Permit Section 4.5, 4.5.1 and 4.5.2

Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Suspended Solids, Total	Daily Max	40 mg/L	Monthly	Grab	Applicable if any sample is equal to or greater than 30.0 mg/L. See Permit Sections 4.5 and 4.5.1
Suspended Solids, Total	Monthly Avg	40 mg/L	Monthly	Grab	Applicable if any sample is equal to or greater than 30.0 mg/L. See Permit Sections 4.5 and 4.5.1
pH Field	Daily Min	6.0 s.u.	Quarterly	Grab	See Permit Section 4.6
pH Field	Daily Max	9.0 s.u.	Quarterly	Grab	See Permit Section 4.6
Chlorine, Total Residual	Daily Max	38 ug/L	Monthly	Grab	See Permit Section 4.7, 4.7.1 and 4.7.2
Chlorine, Total Residual	Monthly Avg	38 ug/L	Monthly	Grab	See Permit Section 4.7, 4.7.1 and 4.7.2
Phosphorus, Total (No sources of Phosphorus present)	Monthly Avg	See Permit Table 2 mg/L	Quarterly	Grab	See Permit Sections 4.8.1, 4.8.3 and 4.8.4
Phosphorus, Total (Sources of Phosphorus present)	Monthly Avg	See Permit Table 2 mg/L	Quarterly	Grab	See Permit Sections 4.8.2, 4.8.3 and 4.8.4
Phosphorus, Total (Sources of Phosphorus present)	6-Month Avg	See Permit Table 2 mg/L	Quarterly	Grab	Compliance with a 6-month average is measured each April and October. See Permit Sections 4.8.2, 4.8.3 and 4.8.4
Arsenic, Total Recoverable	-	-	Quarterly	Grab	See Permit Section 4.9, and 4.9.1
Oil and Grease	Daily Max	15 mg/L	Annual	Grab	Applicable if all samples are less than 7.5 mg/L. See Permit Sections 4.10 and 4.11

Parameter	Limit Type	Limit and Units	Sample Frequency	Sample Type	Notes
Oil and Grease	Monthly Avg	15 mg/L	Annual	Grab	Applicable if all samples are less than 7.5 mg/L. See Permit Sections 4.10 and 4.11
Oil and Grease	Daily Max	15 mg/L	Quarterly	Grab	Applicable if any sample is equal to or greater than 7.5 mg/L. See Permit Sections 4.10
Oil and Grease	Monthly Avg	15 mg/L	Quarterly	Grab	Applicable if any sample is equal to or greater than 7.5 mg/L. See Permit Sections 4.10
BOD ₅ , Total	-	mg/L	Annual	Grab	See Permit Section 4.11
Nitrogen, Ammonia (NH ₃ -N) Total	-	mg/L	Annual	Grab	See Permit Section 4.11
Temperature Maximum	Variable Daily Maximum or Daily Maximum and Weekly Average	See Permit Tables 3 and 4 °F	Monthly	Multiple Grab or Continuous	See Permit Sections 4.6, 4.12 and 4.12.1
Temperature, Variable Limit		°F	Monthly	See Table 4	Use Permit Table 4 look up the applicable temperature limit and report the variable limit on the eDMR. See Permit Section 4.12.1
Water Treatment Additives	TBD	TBD	Monthly	Daily Log	See Permit Section 5

Explanation of Surface Water Discharge Requirements

This section applies to discharges to surface water. Surface water discharge means any discernible, confined and discrete conveyance system including but not limited to any pipe, ditch, channel, tunnel, conduit, swale, or storm sewer that will carry wastewater to surface waters within the state of Wisconsin. Any discharge to a wetland is considered a surface water discharge consistent with s. NR 102.245(1), Wis. Adm. Code. A wetland

is defined in s. NR 103.02 (5), Wis. Adm. Code, as an area where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions.

Explanation of Monitoring Requirements and Effluent Limitations

According to s. NR 205.08(2), Wis. Adm. Code, the department may include monitoring requirements and effluent limitations in general permits. Sections below explain the rationale and assumptions used in deriving the monitoring requirements and effluent limitations.

Sample Frequency: Samples shall be taken at the frequencies specified in the WPDES permit authorizing discharge pursuant to s. NR 218.10, Wis. Adm. Code. Also, the department shall determine on a case-by-case basis, the monitoring frequency to be required for each effluent limitation in a permit in accordance with s. NR 205.066(1), Wis. Adm. Code.

Sample Type: The method of sampling shall be that specified in the WPDES permit pursuant to s. NR 218.11, Wis. Adm. Code. The definition of grab samples, estimate and daily log remain the same as the previous permit. The following abbreviations are typically used when referring to the concentration of a substance in a discharge:

- mg/L = milligrams per liter = parts per million
- µg/L = micrograms per liter = parts per billion

Reporting Frequency: Monitoring results shall be reported at the intervals specified in the permit pursuant to s. NR 205.07(1)(r), Wis. Adm. Code.

Flow Rate: For the department to assure compliance with permit limitations, monitoring and reporting is required for the volume of effluent discharged from each outfall pursuant to s. 283.55(1)(b), Wis. Stats., and 40 CFR 122.44(i)(1). A daily flow estimate shall be recorded and submitted on the monthly electronic Discharge Monitoring Form. Daily estimates replace the frequency of quarterly. This was done to obtain a complete picture of discharge volumes and frequency.

Total Suspended Solids (TSS): The daily maximum limit of 40 mg/L remains unchanged from the previous permit. The TSS daily maximum effluent limit is achievable by the application of simple settling equipment to remove suspended solids from the discharge. A monthly average TSS limit is also needed in this permit in order to comply with s. NR 205.065(7), Wis. Adm. Code, and 40 CFR 122.45(d). The sample frequency of quarterly remains unchanged from the previous permit, except, if any sample result shows a discharge above 30 mg/L, the permittee is required to report to their department general permit contact and the monitoring frequency will increase to monthly for 1 year beginning the month following receipt of the sample result. This change was made to maintain surface water quality levels acceptable for multiple receiving water designations identified in ch. NR 104, Wis. Adm. Code.

In the previous permit, facilities that discharged to a U.S. EPA approved TMDL watershed were required to follow the conditions in Appendix E. These conditions have been moved to Permit Section 4.5.1. Existing permittees shall submit an updated optimization report once each permit term as part of the reissuance application

package. New permittees will submit the optimization report for approval within 12 months of coverage.

The previous permit also provided an opportunity for reduced or waived monitoring. All reductions and waivers are rescinded. The permittee may request reduced monitoring to annual or waiver from the department if all sample results are under 30 mg/L over two consecutive years. Monitoring may be waived only if concentrations of TSS in the effluent are negligible compared to applicable permit limits.

pH Monitoring: To ensure accuracy, all pH samples have a 15-minute maximum hold time; therefore, transporting to an offsite laboratory is likely not feasible. Permittees are responsible for obtaining pH equipment that meets an approved method found in ch. NR 219, Wis. Adm. Code, Table B (28). The pH is limited to the range of 6.0 to 9.0 standard units. This is consistent with the pH water quality-based range for waters classified for fish and aquatic life pursuant to s. NR 102.04(4)(c), Wis. Adm. Code. Any wastewater with a pH outside the range of 6.0 to 9.0 s.u. shall not be discharged directly to surface waters. Monitoring for pH is required on a quarterly basis using a grab sample. This monitoring frequency may be reduced to annual monitoring if no permit violations have occurred over two consecutive years and approved in writing by the department.

Total Residual Chlorine (TRC): Many water utilities chlorinate their water supply to ensure protection of human health from microbial or algal contamination. NCCW facilities that utilize chlorinated municipal water supplies and those that directly add chlorine for the purposes of disinfection within their treatment process must be evaluated for their potential to exceed chlorine water quality standards. In the previous permit, facilities were given time to meet TRC limitations through a schedule found in Appendix F. This appendix has been removed, and all permittees are expected to meet the limits of 38 ug/L as a daily maximum and as a monthly average at the time of coverage. Specific sampling requirements have been added to Permit Section 4.6 to ensure accurate data. Note: if the permittee does not use chlorinated source water or directly add chlorine additives, the department will notify the permittee in the coverage letter that monitoring is not required.

The previous permit also provided an opportunity for reduced or waived monitoring. All reductions and waivers are rescinded. The permittee may request reduced monitoring to annual from the department if all sample results are under 38 ug/L over two consecutive years. Monitoring may be waived per Permit Section 4.7.2 if the permittee is able to show the distance to the receiving water is greater than 2,367 feet or via dissipation is below TRC limitations prior to reaching the receiving water. The value of 2,367 feet was calculated in the "Chlorine Dissipation from Non-contact Cooling Water (NCCW) in Storm Drains" memo updated March 13, 2019 (See Attachment A).

Total Phosphorus: Appendix D found in the previous permit set phosphorus water quality-based effluent limits (WQBELs) for permittees discharging to a waterbody that is listed on the 303(d) impaired waters list for a phosphorus impairment. The appendix allowed permittees time to achieve compliance with the WQBELs. This permit term, phosphorus WQBELs based on the receiving water designations identified in ss. NR

102.06 and 217.10(2) Wis. Adm. Code, have been determined and are listed in permit Table 2.

The type of limit(s) is dependent on potential sources of phosphorus in the waste stream. Facilities with no sources of phosphorus are required to meet monthly average limits. Facilities with sources of phosphorus in their waste stream will need to meet both monthly average limits and 6-month average limits. The department will identify the receiving water designation in the permit coverage letter. On a case-by-case basis, existing permittees that are not in a U.S. EPA approved TMDL and have new or lower phosphorus limits that can be found in Permit Table 2 may request the schedule found in Appendix A allowing them three years from the permit effective date to come into compliance.

Section NR 217.10, Wis. Adm. Code, describes the applicability for phosphorus water quality standards which exempts noncontact cooling water discharges where 100 percent of the phosphorus in the discharge originates from the receiving water as intake water (s. NR 217.10(2), Wis. Adm. Code). There may be cases where the water source is groundwater and discharges to surface water and a “same waterbody” determination may be made.

Definition of same body of water

“Same waterbody” is defined in s. NR 106.03(11m), Wis. Adm. Code, as “hydrologically connected waters of the State with similar water quality characteristics in which a pollutant can travel between in a reasonable period of time without significantly changing chemically or physically. Hydrological connections can include surface and groundwater connections.” Additional information is included in s. NR 106.06(6)(e), Wis. Adm. Code, regarding the same waterbody:

An intake pollutant in the source water is considered to be from the same waterbody as the receiving water of the discharge if the permittee successfully demonstrates all of the following to the department:

- That the pollutant would have reached the outfall point in the receiving water within a reasonable period had it not been withdrawn by the permittee.
- That the background concentration of the pollutant in the receiving water is at a similar concentration level to that in the intake water.
- That other water quality characteristics, including temperature, pH and hardness are similar in the intake water and the receiving water.

In cases where the discharge is within a U.S. EPA approved TMDL watershed where NCCW general permit discharges are covered by a group allocation for phosphorus, limitations are not needed.

If discharges are to waters with low background phosphorus concentrations and available stream dilution is great, phosphorus limitations are not needed. This is determined using the equation and definitions in s. NR 217.13(2), Wis. Adm. Code.

$$\text{Limitation} = [(WQC) (Q_s + (1-f)Q_e) - (Q_s - fQ_e) (C_s)]/Q_e$$

Where: **Limitation** = Water quality-based effluent limitation (in units of mass per unit of volume),

WQC = The water quality criterion concentration (in units of mass per unit volume) from s. NR 102.06, Wis. Adm. Code,

Qs = Receiving water design flow (in units of volume per unit time) as specified in s. NR 217.13(2)(b), Wis. Adm. Code,

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 217.13(2)(c), Wis. Adm. Code,

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

Cs = Upstream concentration (in units of mass per unit volume) as specified in s. NR 217.13(2)(d), Wis. Adm. Code.

Phosphorus limitations are set equal to criteria for all waterbodies where there is no assimilative capacity (background concentrations above criteria or stream flows equal to zero). Limits are included as monthly averages and six-month average limits following the expression of limits requirements from s. NR 217.14, Wis. Adm. Code.

Six-Month Average Concentration = the sum of all results for the six-month period divided by the number of results during that time period.

Note: The six-month average effluent limit is applicable during the periods of May through October and November through April.

An individual permit may be issued in cases where limits higher than criteria are appropriate.

A new discharge to a phosphorus impaired water shall follow the requirements in s. NR 217.13(8), Wis. Adm. Code. If a new discharger is proposing a discharge of phosphorus to a receiving or downstream water that is a phosphorus impaired water, the new discharger may not discharge phosphorus except as follows:

- The new discharge of phosphorus is allocated part of the reserve capacity or part of the wasteload allocation in a US EPA approved TMDL;
- The new discharger can demonstrate the new discharge of phosphorus will improve water quality in the phosphorus impaired segment; or
- The new discharger can demonstrate that the new phosphorus load will be offset through a phosphorus trade or other means with another discharge of phosphorus to the 303 (d) listed water. The offset must be approved by the department and must be implemented prior to discharge. Dischargers that plan to offset phosphorus are not eligible for coverage under this general permit but will be issued an individual permit.

In the previous permit, facilities that discharged to an U. S. EPA approved TMDL watershed were required to follow the conditions in Appendix E. These conditions have been moved to Permit Section 4.8. Existing permittees shall submit an updated optimization report once each permit term as part of the reissuance application package. New permittees will submit the optimization report for approval within 12 months of coverage.

Total Recoverable Arsenic (TRA): During the previous permit term, facilities covered under this permit that discharge to Lake Michigan or a harbor to Lake Michigan were required to comply with additional arsenic requirements specified in Appendix G. These

conditions included quarterly sampling for TRA and the submittal of an optimization report. These conditions have been moved to Permit Section 4.9. The optimization requirement has been removed this permit term. Long-term optimization and reduction programs focusing on Lake Michigan have reached the lowest levels technologically achievable.

The applicable human cancer criterion for arsenic in Lake Michigan is 0.2 µg/L to protect public health and welfare and the use of these waters as a public drinking water supply. A preliminary review of available data by the department and the U.S. EPA indicates that the arsenic criteria of 0.2 µg/L is exceeded in Lake Michigan which, in turn, suggests that there is no assimilative capacity. (Note: the arsenic concentrations in Lake Superior are below the criteria, so no additional permit requirements are necessary for NCCW facilities that discharge to Lake Superior.)

The previous permit also provided an opportunity for reduced monitoring. All reductions and waivers are rescinded. The permittee may request reduced monitoring to annual from the department if all sample results are under 0.2 ug/L over two consecutive years, or no detect based on the lowest level of detection (LOD) possible if the LOD is greater than 0.2 ug/L using a method that provides adequate sensitivity.

Oil and Grease: Except for some blowdown systems, most facilities covered under this general permit have no potential to contain oil and grease. Annual monitoring with a daily maximum limit of 15 mg/L is required for all facilities, and any facility with a discharge that contains oil and grease concentrations above 7.5 mg/L will be required to increase their monitoring frequency to quarterly to provide additional monitoring data. The oil and grease limitation of 15 mg/L represents the degree of effluent reduction attainable by the application of best practicable control technology currently available. This is based on the best professional judgment at this time and the requirements and preamble of 40 CFR 423.12 were utilized to make this determination. A monthly average is also needed in this permit in order to comply with s. NR 205.065(7), Wis. Adm. Code, and 40 CFR 122.45(d), and is set equal to the daily maximum limitation.

The permittee may request a monitoring waiver from the department if all sample results are under 7.5 mg/L over two consecutive years.

BOD₅ (Biochemical Oxygen Demand) and Ammonia: Most facilities covered under this general permit are not anticipated to contain significant levels of BOD₅ and ammonia. However, annual monitoring for these parameters will provide the facility and the department an indication of possible cross contamination with process wastewaters. Monitoring for these parameters is required for all facilities on an annual basis using a grab sample. Depending on the results of the monitoring, further monitoring for either or both of these parameters may be warranted if cross contamination is identified. Coverage under an individual WPDES permit may be necessary in these cases unless corrective action can be taken to remove this cross contamination.

The permittee may request a monitoring waiver if there is no reasonable potential for the facility to discharge BOD₅ and/or Ammonia Nitrogen in amounts that would degrade the receiving water.

Temperature: Noncontact cooling water is used to convey heat from the facility; therefore, it contains anthropogenic sources of increased temperature in the effluent. During the previous permit term, thermal monitoring conditions were listed in Appendices A, B and C. The only permittees with temperature limits were those discharging to limited aquatic life waters (Appendix A) and those discharging above 120°F (Appendix B). This permit term, all permittees are subject to limits based on the receiving water type as specified in Table 3 per chs. NR 104 and 106 Wis. Adm. Code, and as applicable for discharges to storm sewers ending in wetlands connected to or discharging directly to other waters (e.g., rivers and waters with unidirectional flow) per the ratio of receiving water stream flow (Q_s) to effluent flow (Q_e). The limits in Table 3 are from ss. NR 106.55(2) - (5), Wis. Adm. Code, for discharges to limited aquatic life waterbodies, effluent channels, storm sewers and wetlands. Additional restrictions for flow rates as shown in Permit Tables 1a and 1b apply for discharges to inland lakes, impoundments or Great Lakes. Additional limits for unidirectional waters as shown in Permit Tables 4a and 4b apply for dischargers to unidirectional waters based on the receiving water flow to effluent flow ratio.

Table 4a applies for dischargers that are covered by a WPDES permit prior to January 1, 2027.

The receiving water flow to effluent flow ratios in this table are based on maximum effluent flow rates. ($Q_s - fQ_e$): Q_e)

Q_s = Receiving water flow rate equal to $\frac{1}{4}$ 7-Q10 or $\frac{1}{4}$ 4-day, 3-year biological flow as specified in s. NR 106.53(1)(a), Wis. Adm. Code.

Q_e = Effluent flow rate in mgd as specified in ss. NR 106.53(2)(b) to (d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, where “ f ” ranges from 0 to 1 and is unitless.

The effluent limitations were calculated using the equation in s. NR 106.55(6), Wis. Adm. Code, for dischargers to unidirectional waters not designated as limited aquatic life. The most restrictive classification was used for each month:

JAN	Lower Wisconsin River
FEB	Lower Wisconsin River
MAR	Upper Wisconsin River
APR	Upper Wisconsin River
MAY	Cold water community
JUN	Cold water community
JUL	Cold water community
AUG	Cold water community
SEP	Cold water community
OCT	Cold water community
NOV	Large warm water sport or forage fish community
DEC	Large warm water sport or forage fish community

At effluent flow rates higher than those in Tables 1a or 1b an individual permit may be necessary with temperature effluent limitations to ensure compliance with temperature water quality standards.

Table 4b applies to new discharges that commence after January 1, 2027. The limits in this table were calculated in a similar manner to the limits in Table 4a. The maximum allowable flow rates are for new dischargers in order to prevent significant lowering of water quality consistent with the requirements in ch. NR 207, Wis. Adm. Code.

The temperature monitoring frequency specified in Section 4.2 has changed in this permit term from quarterly to monthly. Monthly monitoring throughout the permit term was chosen to verify that permittees do not have the potential to exceed temperature limits as outlined in Section 4.12 Table 3 and, as applicable, Table 4a and 4b. During the previous permit term, there was a provision that allowed a permittee to request reduced monitoring or a waiver. This option has been removed this permit term.

4.2.2 Surface Water Narrative Requirements

Surface water narrative water quality criteria pursuant to s. NR 102.04(1), Wis. Adm. Code, are included in the permit. These criteria shall be followed at all times and under all flow and water level conditions.

4.2.3 Wetland Narrative Requirements

Wetland narrative water quality criteria pursuant to s. NR 103.03(2), Wis. Adm. Code, are included in the permit. These criteria shall be followed at all times so that wetland water quality-related functional values or uses of wetlands as stated in s. NR 103.03(1), Wis. Adm. Code, are protected.

5 Water Treatment Additives

Changes from Previous Permit

- Section 2.1 of the prior NCCW general permit has been updated with language consistent with other WPDES general permits and relocated to Section 5 of this permit.
- Table 2.1.2 in the prior NCCW general permit has been removed and applicants shall refer to Section 5 of this permit and the department guidance available at [Additives Information https://dnr.wisconsin.gov/topic/Wastewater/Additives.html](https://dnr.wisconsin.gov/topic/Wastewater/Additives.html).

5.1 Use of Water Treatment Additives

The permittee shall not add any substance or water treatment additive to the discharge to a surface water unless the use of the water treatment additive is reviewed and approved, in writing, by the department pursuant to s. 283.31(3)(d)1., Wis. Stats., and ss. NR 105.02(3), NR 105.05, NR 106.05(1)(b), and NR 106.10, Wis. Adm. Code, to protect Wisconsin's surface water resources from such products. A water treatment additive review by the department is only necessary for water treatment additives that may enter surface water without receiving treatment. Water treatment additives already present in the water supply do not need to be reviewed and approved.

Examples of water treatment additives include biocides (e.g., algacides, microbicides, fungicides, and molluscicides), water quality conditioners (e.g., scale and corrosion inhibitors, pH adjustment chemicals, oxygen scavengers, conditioning agents, and water softening compounds), dechlorination chemicals, erosion control products, and clarifying agents. Water treatment additives already present in the water supply do not need to be reviewed and approved.

5.2 Approval of Water Treatment Additives Usage

On April 23rd, 2015, the department released guidance entitled "Water Quality Review Procedures for Additives" (3400-2015-03), which is available at [Additives Information https://dnr.wisconsin.gov/topic/Wastewater/Additives.html](https://dnr.wisconsin.gov/topic/Wastewater/Additives.html). This guidance supports the authority of ss. 283.31(3)(d)1., Wis. Stats. and ss. NR 105.02(3), NR 105.05, NR 106.05(1)(b), and NR 106.10, Wis. Adm. Code, to protect Wisconsin's surface water resources from such products. This guidance document establishes procedures to calculate secondary acute and chronic values for water treatment additives pursuant to ss. NR 105.05 and NR 105.06, Wis. Adm. Code. Secondary acute values are the concentrations of a pollutant in surface water that protect aquatic life from adverse short-term effects. Therefore, facilities shall submit information regarding the toxicity of any added substances or additives to the discharge as specified in the permit, so the department can determine if it is allowable and will not negatively impact aquatic life or human health. The department shall also be informed of significant changes in additive usage or new additives that would raise the potential for negative impacts on aquatic life or human health.

5.2.1 New Discharge

Any permittee that proposes a new discharge to a surface water during the permit term that has not been covered under this general permit and wishes to commence use of a

water treatment additive shall submit a copy of the Additive Review Worksheet and SDS to the department for each water treatment additive used which requires department approval with the NOI. The department will transmit the additive use approval on the coverage letter to the permittee. The permittee shall comply with the conditions specified in the coverage letter.

These requirements are based on ss. NR 106.10(2), NR 205.07(1)(L), NR 205.08(3), Wis. Adm. Code and s. 283.37(6), Wis. Stats.

5.2.2 Existing Discharge

Any permittee with an existing discharge that has been granted coverage under this general permit during the permit term and wishes to commence use of a new water treatment additive or increase the usage of an approved water treatment additive shall submit a written request with a copy of the Additive Review Worksheet and SDS to the department for each water treatment additive used which requires department approval. The permittee must receive written approval from the department prior to initiating such changes. The department will transmit an additive use approval letter to the permittee. The permittee shall comply with the conditions specified in the approval letter.

These requirements are based on ss. NR 106.10(2), NR 205.07(1)(L), NR 205.07(3)(c), NR 205.08(3), Wis. Adm. Code and s. 283.37(6), Wis. Stats.

5.3 Water Treatment Additive Usage Record

Facilities are required to maintain records of additive use for department inspection. Recording additive use will provide documentation for the facility and the department to verify that the additive is being used and discharged in accordance with the permit requirements.

5.4 Public Notice of Additive Use Restrictions

If the department determines that a water treatment additive requires a usage restriction and effluent limits, the department is required to public notice those proposed limits prior to the limits becoming effective and implemented through this general permit. The public notice period is to last 30 days and be published in a newspaper of general circulation in the area affected by the discharge and the department's public notice webpage. The public notice procedures are based on s. NR 203.02, Wis. Adm. Code.

6 Antidegradation, Impaired Waters & TMDLs, and Wetland Requirements

6.1 Antidegradation Standard and Procedures

Any permittee proposing a new discharge of wastewater to a surface water of the state is in compliance with the antidegradation policy in s. NR 102.045, Wis. Adm. Code and antidegradation evaluation procedures in ch. NR 207, Wis. Adm. Code, when the department determines that the discharge is authorized for coverage under this general permit via letter. Any proposed new or increased discharge of wastewater an ORW or ERW must also comply with Section 6.1 prior to the discharge, to demonstrate compliance with the antidegradation standard in s. NR 102.045), Wis. Adm. Code and antidegradation evaluation procedures in ch. NR 207, Wis. Adm. Code. Any new or increased discharge of wastewater would not be applicable to the antidegradation evaluation procedures in ch. NR 207, Wis. Adm. Code, if the discharge is in compliance with the effluent limitations or performance standards in this general permit.

The department has included applicability criteria under Section 6 to exclude those discharges that may be inconsistent with the antidegradation standard in s. NR 102.045, Wis. Adm. Code and requires further antidegradation evaluation by the department under ch. NR 207, Wis. Adm. Code, and an individual permit. The department will prescribe site-specific effluent limitations in the individual permit to be protective of water quality and existing and future designated uses of a surface water. General permits may contain applicability criteria pursuant to s. NR 205.08(2), Wis. Adm. Code. When the department determines a discharge is authorized for coverage under this general permit by letter, the department is assuring that the discharge meets the applicability criteria.

- Any permittee that proposes a new or increased discharge to a surface water of the state applying for coverage under this general permit shall control, manage, or treat the proposed new or increased discharge and maintain treatment levels sufficient to meet the effluent limitations in this permit. Those permittees that do not have treatment capability to treat any proposed new or increased discharge and maintain treatment levels sufficient to meet the effluent limitations are not authorized under this general permit and must either apply for an individual permit or find an alternative discharge location.
- Effluent limitations in this general permit are based on applicable procedures and criteria in chs. NR 102, NR 103, NR 105 and NR 106, Wis. Adm. Code, and on categorical effluent limitation procedures pursuant to chs. NR 200 to NR 297, Wis. Adm. Code as appropriate.
- Any proposed new or increased discharge that is found to result in a significant lowering of water quality, by containing pollutants not regulated by this general permit are not authorized under this general permit and must either apply for an individual permit or find an alternative discharge location.
- Any proposed new or increased discharge of wastewater to outstanding and exceptional resource waters in ch. NR 102, Wis. Adm. Code, or discharges that would lower the water quality of downstream outstanding and exceptional water

resources are not authorized by this permit and must either apply for an individual permit or find an alternative discharge location.

- Any discharge that will contain a pollutant of concern that will contribute to the impairment of a 303(d) listed impaired water that does not have a federally approved TMDL; or be inconsistent with a federally approved TMDL is not authorized by this permit and must either apply for an individual permit or find an alternative discharge location.

6.2 Persistent, Bioaccumulating Toxic Pollutants.

In accordance with s. NR 102.12, Wis. Adm. Code, language for persistent, bioaccumulating toxic pollutants has been added.

6.3 Impaired Waters & TMDL Requirements

The section 303(d) list of Wisconsin impaired surface water bodies may be obtained by contacting the department or by searching for the section 303(d) list on the department's Internet site: [Water Condition Lists](https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html) <https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html>. The department updates the section 303(d) list approximately every two years. State and Federal Approved TMDLs can be identified by contacting the department, or by searching for the State and Federal Approved TMDL list on the department Internet site: [Approved TMDLs](https://dnr.wisconsin.gov/topic/TMDLs/TMDLReports.html) <https://dnr.wisconsin.gov/topic/TMDLs/TMDLReports.html>.

6.4 Wetland Requirements

Mapped wetlands may be obtained by contacting the department or by searching for wetland on the departments Internet site: [Surface Water Data Viewer](https://dnr.wisconsin.gov/topic/SurfaceWater/swdv) <https://dnr.wisconsin.gov/topic/SurfaceWater/swdv>. Permittees may not establish a new discharge to a wetland until the department has determined that the proposed discharge meets the wetland requirements in Section 4.14 and in ch. NR 103, Wis. Adm. Code.

7 Standard Requirements

The permit provides a Standard Requirements section that contains conditions and requirements that are, for the most part, applicable to all WPDES general permits. According to s. NR 205.08(2), Wis. Adm. Code, the department may include general conditions (standard requirements) in general permits.

Changes from Previous Permit

Changes to the standard requirements section include:

- The Standard Requirements section has been updated to maintain consistency with other WPDES general permits. Several sections from the prior permit have been relocated from sections 2 and 5 of the prior permit to Section 7 of this permit.
- The Monitoring, Reporting and Record Keeping Requirements have been relocated to Section 7.1 and include updated Switchboard and MyWisconsin ID (MWID) requirements due to the WI DNR Switchboard migration from the prior Web Access Management Systems (WAMS) to MWID.
- The following sections have been added to this permit to maintain consistency with other WPDES permits:
 - Section 7.2, General Conditions for General Permits;
 - Section 7.3.2, Operator Certification for Facilities with Dechlorination Systems;
 - Section 7.3.5, Removed Substances;
 - Section 7.3.6, Spill Reporting;
 - Section 7.3.9, Permit as Enforcement Shield;
 - Section 7.4, General Conditions Specific to Non-POTW Permits.
- Section 7.2.4, Permit Coverage Terminations, has been updated to reflect that the new electronic version of the Notice of Termination (eNOT) Form 3400-221 is available for all WPDES general permits.

8 Summary of Reports Due

A summary of reports due has been added for informational purposes for the permittee to keep track of the due dates of permit reports and to be consistent with other WPDES permits.

Appendix A – Phosphorus Schedule for Existing Dischargers Absent a U.S. EPA Approved TMDL

The department has added the schedule to allow existing permittees time to come into compliance with any new or more stringent requirements in the permit. For information about due dates provided in this schedule, see the summary of reports due in Section 8.

Other Changes from Previous Permit

- Appendices in the prior permit have been relocated to Section 4 of the permit.
- Information on the policy and regulations on water treatment additives has been modified and moved to the permit in Section 5.
- Information and policy on antidegradation, impaired waters, TMDLs, and wetlands have been modified/added to the permit under Section 6.

Attachments

A. Chlorine Dissipation from Non-contact Cooling Water (NCCW) in Storm Drains

Prepared by:

Leila Jenkins
Wastewater Specialist
Bureau of Water Quality
Date: 08/10/2026

Attachment A

CORRESPONDENCE / MEMORANDUM

State of Wisconsin

DATE: December 17, 2015, Updated March 13, 2019

TO: Amanda Minks – WY/3

FROM: Jason Knutson – WY/3

SUBJECT: Chlorine Dissipation from Non-contact Cooling Water (NCCW) in Storm Drains

Purpose:

The purpose of this calculation is to calculate the travel distance within storm drains required for chlorine to dissipate from concentrations typically found in drinking water (0.2-0.4 mg/L) to a concentration not expected to cause an exceedance of Wisconsin's Water Quality Standard.

The nature of this calculation is intentionally conservative in that it neglects two significant sinks of chlorine during transport: (1) dissipation during the wastewater's drop into the storm drain and (2) degradation of chlorine due to contact with organic material within the storm drain. It only considers dissipation of chlorine during laminar flow through the storm drain.

The inputs to this calculation may be changed so that the memo can be applied to other scenarios. However, there is no substitute for collection of real data where feasible. Therefore, this memo's methodology should only be applied in situations where sampling is infeasible and low-threat (i.e. to transient/sporadic discharges of low volumes). It should not be used when data collection is feasible.

Summary:

Chlorine levels in non-contact cooling water (NCCW) will be reduced to Wisconsin's Water Quality standard by the time the NCCW travels 1860-2367 feet within storm sewers (depending upon the initial concentration of chlorine). Dischargers covered under Wisconsin's NCCW General Permit who are situated greater than 2367 feet away from the receiving water do not pose reasonable potential to cause or contribute to an exceedance of water quality standards for chlorine, so long as chlorine concentrations within their discharge are not above the typical max concentration in potable water (approximately 0.4 mg/L)

Inputs and Justifications:

- **Flow rate (Q) = 1.6 MGD (2.476 fps).** This effluent flow rate approximates the 90th percentile of effluent flow rates of NCCW General Permit holders in the state. It was selected as the Q for conservative purposes.
- **Manning Coefficient (n) = 0.013.** Concrete pipes typically have Manning coefficients between 0.012 and 0.014 (Munson et al 569). The 0.013 value was

confirmed by the Department's stormwater engineers as the typical for storm drain calculations.

- **Slope of storm drains (S) = 1%.** The Department's stormwater engineers concurred that a typical slope for storm drains is around 1%.
- **Storm drainpipe diameter (D) = 1.5 feet.** The typical minimum size for storm drains is 12" diameter. However, size increases with proximity to the receiving water, so storm drain outfalls less than 18" in diameter are uncommon. Because the calculations in this model are focused on the final few thousand feet before the outfall, a size of 18" was used as an input.
- **Concentration of chlorine (C₀) = 0.4 mg/L.** The concentration of chlorine within typical potable water, at the point of use, is typically between 0.2 and 0.4 mg/L. The top of the range was selected in interest of making a conservative assumption.
- **Wisconsin's Water Quality Standard for Chlorine (C) = 0.038 mg/L.** It should be noted that 0.019 mg/L is the actual standard, but a factor of 2 is applied to account for dilution in the receiving waterbody.
- **Molecular Weight of O₂ = 32.0 g/mol**
- **Molecular Weight of Cl₂ = 70.9 g/mol**
- **K = 1.49.** This is the correction factor for use of British Units in the Manning equation.

Equations used:

$$\text{Manning equation} \quad V = \frac{K}{n} R_h^{\frac{2}{3}} S^{\frac{1}{2}} \quad (1) \quad (V \text{ [ft/s]}, K \text{ []}, n \text{ []}, R_h \text{ [ft]}, S \text{ []})$$

$$\text{or} \quad Q = \frac{K}{n} A R_h^{2/3} S^{1/2} \quad (2) \quad (Q \text{ [ft}^3\text{/s]}, K \text{ []}, n \text{ []}, A \text{ [ft}^2\text{]}, R_h \text{ [ft]}, S \text{ []})$$

$$\text{Area under a chord} \quad A = \frac{D^2 (\theta - \sin \theta)}{8} \quad (3)$$

$$\text{Wetted Perimeter} \quad P = \frac{D\theta}{2} \quad (4)$$

$$\text{Hydraulic Radius} \quad R_h = \frac{A}{P} = \frac{D (\theta - \sin \theta)}{4\theta} \quad (5)$$

$$\text{Depth of Flow} \quad d = \frac{D}{2} \left(1 - \cos\left(\frac{\theta}{2}\right)\right) \quad (6)$$

$$\text{from Thin Film Theory:} \quad \frac{k_{Cl_2}}{k_{O_2}} = \frac{\sqrt{MW_{Cl_2}}}{\sqrt{MW_{O_2}}} \quad (7)$$

$$\text{Reaeration Equation (Owens et al)} \quad k_{O_2} = \frac{23.2 V^{0.73}}{d^{1.75}} \quad (8) \quad (k_{O_2} \text{ [d}^{-1}\text{]}, V \text{ [ft/s]}, d \text{ [ft]})$$

$$\text{First Order Decay} \quad C = C_0 e^{-k_{Cl_2} t} \quad (9)$$

- See next page for definition of variables used above -

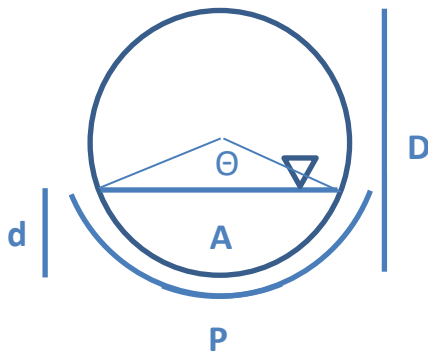


Figure 1: Cross-section of a pipe, for use with equations (3) - (5).

A = Cross-sectional area of flow

d = depth

D = Diameter

P = Wet

$R_h = Hy$

t = time

V = Average velocity of NCCW in storm drain

Θ = Angle from pipe center to NCCW surface

Calculation:

Step 1: Calculate depth of flow in storm drain

Substitute the Area Under Chord equation (3) and the Hydraulic Radius equation (5) into the Manning equation (2) for A and R_h :

$$Q = \frac{K}{n} (A) (R_h)^{2/3} S^{1/2}$$

$$Q = \frac{K}{n} \left(\frac{D^2 (\theta - \sin \theta)}{8} \right) \left(\frac{D (\theta - \sin \theta)}{4\theta} \right)^{2/3} S^{1/2}$$

$$Q = \frac{K}{n} \frac{D^{8/3}}{2^{13/3}} \frac{(\theta - \sin \theta)^{5/3}}{\theta^{2/3}} S^{1/2}$$

Solving this equation for Θ , using the inputs stated above, gives:

$$\theta = 2.4474 \text{ radians}$$

Plug this into the Depth of Flow equation:

$$d = \frac{D}{2} \left(1 - \cos \left(\frac{(2.4474)}{2} \right) \right)$$

$$d = 0.49488 \text{ feet}$$

Step 2: Calculate the average velocity of NCCW in the storm drain

Find the submerged cross-sectional area using Θ and the Area Under Chord equation (3):

$$A = \frac{D^2 ((2.4474) - \sin(2.4474))}{8}$$

$$A = .50841$$

Divide the Flow Rate by the Cross-sectional Area to find the average flow velocity:

$$V = \frac{Q}{A} = \frac{2.47557 \text{ ft}^3/\text{s}}{.50841 \text{ ft}^2}$$

$$V = 4.8701 \text{ feet/second}$$

Step 3: Calculate the distance required for sufficient dissipation of chlorine

The Owens, et al. reaeration equation is an empirical equation used to model the rate at which oxygen is exchanged between air and water (the reaeration rate or gas exchange rate for O_2):

$$k_{O_2} = \frac{23.2 V^{0.73}}{d^{1.75}}$$

According to the Thin Film Theory, the ratio of the square roots of molecular weights of two gases is equal to the ratio of their gas exchange coefficients. Solve for the gas exchange rate for Cl_2 by substituting in the Owens, et al. equation:

$$\frac{k_{Cl_2}}{k_{O_2}} = \frac{\sqrt{MW_{Cl_2}}}{\sqrt{MW_{O_2}}}$$

$$k_{Cl_2} = k_{O_2} * \frac{\sqrt{MW_{Cl_2}}}{\sqrt{MW_{O_2}}}$$

$$k_{Cl_2} = \frac{23.2 V^{0.73}}{d^{1.75}} * \frac{\sqrt{MW_{Cl_2}}}{\sqrt{MW_{O_2}}}$$

Assuming that the concentration of Chlorine in the air is negligible, the following first-order decay equation represents the dissipation of chlorine from water:

$$C = C_0 e^{-k_{Cl_2} t}$$

Solve it for time:

$$t = \frac{\ln(C/C_0)}{-k_{Cl_2}}$$

Multiply by velocity to solve for distance the water must travel for chlorine to dissipate:

$$distance = \frac{\ln(C/C_0)}{-k_{Cl_2}} * V$$

Factor in a correction of units:

$$distance = \frac{\ln\left(\frac{C}{C_0}\right)[\]}{-k_{Cl_2} [d^{-1}]} * V [ft/s] * \frac{60*60*24 s}{1 day}$$

Substitute the derived equation for k_{Cl_2} into this equation, and solve for distance:

$$distance = - \frac{\ln\left(\frac{C}{C_0}\right) * d^{1.75} \sqrt{MW_{O_2}}}{23.2 * \sqrt{MW_{Cl_2}}} * V^{0.27} * \frac{86,400 s}{1 day}$$

$$distance = - \frac{\ln\left(\frac{0.038}{0.4}\right) * (0.49488 ft)^{1.75} \sqrt{32.0 \frac{g}{mol}}}{23.2 * \sqrt{70.9 \frac{g}{mol}}} * \left(4.8701 \frac{ft}{s}\right)^{0.27} * \frac{86,400 s}{1 day}$$

***distance = 2637 feet
required for dissipation of chlorine to WQS***

***(Note that if an initial concentration of 0.2 mg/L is assumed, distance
required until dissipation is 1860 feet)***