Clearinghouse Rule 19-105

DRAFT #3
July 2019

ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD
CREATING RULES

The Wisconsin Natural Resources Board proposes an order to: **create** NR 111 relating to cooling water intake structures.

WY-19-14

Analysis Prepared by the Department of Natural Resources

1. Statute Interpreted:

Section 283.31 (6), Wis. Stats., 281.003(2)

2. Statutory Authority:

Sections 283.11, 283.31, 283.37, 283.55, 283.83, and 227.11 (2) (a), Wis. Stats.

3. Explanation of Agency Authority:

Chapter 283, Wis. Stats., grants authority to the department to establish, administer and maintain a Wisconsin Pollutant Discharge Elimination System (WPDES).

Sections 283.11, 283.31, and 227.11(2)(a), Wis. Stats., provide authority to promulgate rules to administer the WPDES permit program consistent with federal requirements and to include terms and conditions in permits consistent with federal regulations.

Section 283.31 (6), Wis. Stats., grants authority to require that the location, design, construction and capacity of water intake structures reflect the best technology available for minimizing adverse environmental impact.

Section 283.37, Wis. Stats., provides authority to establish rules for permit applications.

Sections 283.55, and 227.11(2)(a), Wis. Stats., grant authority to the department to establish monitoring requirements in permits.

Section 283.83, Wis. Stats., provides authority for a continuing planning process, which includes schedules of compliance for limitations.

The department also has authority to promulgate rules under s. 227.11 (2) (a), Wis. Stats., necessary to administer the specific statutory requirements and effectuate the purpose of ch. 283, Wis. Stats.

4. Related Statutes or Rules:

These rules relate indirectly to the WPDES permit program that regulates wastewater discharges. Related rules include all other rules that comprise the WPDES permit program and include chapters NR 100 to 106 and 200 to 299, Wis. Adm. Code.

5. Plain Language Analysis:

The purpose of the proposed rule is to ensure that the state's regulations are consistent with federal regulations. Minor clarifications and corrections will also be made.

Under the federal water pollution control act (Clean Water Act), the U.S. Environmental Protection Agency (EPA) has a responsibility to promulgate rules addressing the impingement and entrainment of aquatic organisms at cooling water intake structures. Effective January 17, 2002 and October 14, 2014, the EPA promulgated rules that specify requirements for New Facilities and Existing Facilities that address impingement and entrainment at cooling water intake structures. In order to be consistent with the EPA-promulgated New Facilities and Existing Facilities Rules, the Department of Natural Resources (the department) is proposing to create ch. NR 111, Wis. Adm. Code.

6. Summary of, and Comparison with, Existing or Proposed Federal Statutes and Regulations:

Following the revisions contained in this rule package, the department rules will be consistent with existing federal regulations:
40 CFR 122.21(r) – Application requirements;
40 CFR 125 Subpart I – Requirements for New Facilities;
40 CFR 125 Subpart J – Requirements for Existing Facilities;
33 U.S.C. § 1326(b), Clean Water Act section 316(b) – Requirements for facilities with cooling water intake structures

7. Comparison with Similar Rules in Adjacent States:

All the other adjacent states including EPA Region 5 states (Illinois, Indiana, Michigan, Minnesota, and Ohio) and EPA Region 7 states (Iowa, Nebraska, Kansas and Missouri) are subject to the EPA regulations that apply to the National Pollutant Discharge Elimination System permit program and that are delegated to the states for implementation, and therefore, have the same requirements as Wisconsin. The proposed rule does add select definitions to clarify implementation of the rule, and such definitions are not in place in neighboring states.

8. Summary of Factual Data and Analytical Methodologies Used and How Any Related Findings Support the Regulatory Approach Chosen:

Not applicable.

9. Analysis and Supporting Documents Used to Determine the Effect on Small Business or in Preparation of an Economic Impact Report:

The economic impact analysis was done by creating four categories of compliance with the federal rule, estimating the cost of compliance associated with each category, and then finally estimating the number of facilities in each category. The four categories are: currently in compliance with lower operating costs, currently in compliance with higher operating costs, not in compliance with the 0.5 feet per second (fps) standard and has a lower cost of coming into compliance, and not in in compliance with the 0.5 fps standard and has a higher cost of coming into compliance. The following documents were used to make

the economic impact analysis:

- Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule. EPA-821-R-04-005 (February 2004).
- Technical Development Document for the Final Section 316(b) Phase II Existing Facilities Rule EPA 821-R-04-007 DCN 6-0004 (February 12, 2004).
- "Technical Development Document for the Final Section 316(b) Existing Facilities Rule," U.S. Environmental Protection Agency EPA-821-R-14-002 (May 2014).

10. Effect on Small Business (initial regulatory flexibility analysis):

The rule will primarily impact power plants and paper mills in Wisconsin and is not expected to affect small businesses. It is expected that no or very few small businesses with an intake structure have intakes with design intake flows that are greater than the minimum threshold and therefore would be subject to the federal rule.

11. Agency Contact Person:

Emma Lorenzen
Wisconsin Department of Natural Resources
Bureau of Water Quality WY/3
101 S. Webster Street
PO Box 7921
Madison, WI 53707-7921
Emma.Lorenzen@wisconsin.gov

12. Place where comments are to be submitted and deadline for submission:
Written comments may be submitted at the public hearings, by regular mail, or email to:
Emma Lorenzen
Department of Natural Resources
Bureau of Water Quality WY/3
101 S. Webster Street
PO Box 7921
Madison, WI 53707-7921
Emma.Lorenzen@wisconsin.gov
(608) 267-7643

Written comments may also be submitted to the Department at DNRAdministrativeRulesComments@wisconsin.gov.

Public hearings will be held on the following dates:

Date: September 9, 2019
Time: 3:00 p.m.
Location: WI Department of Natural Resources, 101 S. Webster St., Madison, WI 53707, Room G27

Date: September 11, 2019
Time: 1:00 p.m.
Location: WI Department of Natural Resources, 5301 Rib Mt. Dr., Wausau, WI 54401

The deadline for submitting public comments is September 18, 2019.

The consent of the Attorney General will be requested for the incorporation by reference of 40 CFR 122.2, 122.29(b) (1), (2), (4), ss. NR 40.04 (2) (d), ss. NR 40.05 (2) (d), s. NR 20.38, s. NR 205.07(1)(g) and s. 283.01(12), Stats.

SECTION 1. NR 111 is created to read:

CHAPTER NR 111
COOLING WATER INTAKE STRUCTURES

SUBCHAPTER I
GENERAL

NR 111.01 Purpose. The purpose of this chapter is to establish requirements that apply to cooling water intake structures, including requirements that apply to location, design, construction, and capacity of cooling water intake structures at new facilities. The chapter includes standards for minimizing adverse environmental impact associated with the use of cooling water intake structures and required procedures, including permit application requirements and information submission requirements, for establishing the appropriate technology requirements at certain specified facilities, and monitoring, reporting, and recordkeeping requirements to demonstrate compliance. In combination, these components represent the best technology available for minimizing adverse environmental impact associated with the use of cooling water intake structures. These requirements are established and implemented in Wisconsin pollutant discharge elimination system permits issued under s. 283.31 (6), Stats.

Note: This regulation does not authorize take, as defined by the endangered species act, 16 USC 1532 (19). The U.S. fish and wildlife service has determined that any impingement, including entrapment or entrainment of federally-listed species constitutes take. Such take may be authorized pursuant to the conditions of a permit issued under 16 USC 1539 (a) or where consistent with an incidental take statement contained in a biological opinion pursuant to 16 USC 1536 (o).

NR 111.02 Applicability.

(1) In this section:

(a) "Greenfield facility" means a facility that is constructed at a site at which no other source is located, or that totally replaces the process or production equipment at an existing facility, as specified in 40 CFR 122.29 (b) (1) (i) and (ii).

(b) "Stand-alone facility" means a new, separate facility that is constructed on property where an existing facility is located and whose processes are substantially independent of the existing facility at the same site, as specified in 40 CFR 122.29 (b) (1) (iii).

(2) This chapter applies to a facility that meets all of the following conditions:

(a) The facility is a point source.

(b) The facility uses or proposes to use one or more cooling water intake structures with a cumulative design intake flow greater than 2 million gallons per day.

(c) The facility has at least one cooling water intake structure and uses at least 25 percent of the total water withdrawn on a whole-facility basis exclusively for cooling purposes as specified in sub. (6).

(3) For purposes of this chapter, a facility may be classified as either an existing facility or a new facility, in accordance with all of the following:

(a) A facility shall be classified as an existing facility if construction commenced on the facility on or before January 17, 2002. Any modification of the facility or any addition of a unit at the facility does not change its classification as an existing facility.

(b) 1. A facility shall be classified as a new facility if all of the following apply:

a. The facility consists of any building, structure, facility, or installation that meets the definition and criteria of a "new source" or "new discharger" under 40 CFR 122.2 and 122.29 (b) (1), (2), and (4)

b. The facility is either a greenfield or stand-alone facility.

c. Construction commenced on the facility after January 17, 2002.

d. The facility uses either a newly constructed cooling water intake structure, or an existing cooling water intake structure whose design capacity is increased to accommodate the intake of additional cooling water.

2. New units that are added to a facility for the purposes of the same general industrial operation, such as new peaking units at an electrical generating station, shall not be considered new facilities.

3. A facility that has been built adjacent to a facility that qualifies as an existing facility under par. (a) is a new facility if it otherwise meets the standards for a new facility under this paragraph, while the original facility remains as an existing facility.

(c) A facility cannot be both an existing facility and a new facility.

(4) Use of a cooling water intake structure includes obtaining cooling water by any contract or arrangement with one or more independent suppliers of cooling water if the supplier withdraws water from surface waters of the state. An owner or operator of an existing facility may not circumvent these requirements by creating special arrangements to receive cooling water from an entity that is not itself a facility subject to this chapter.

(5) Obtaining cooling water from a public water system, using reclaimed water from wastewater treatment facilities or desalination plants, or recycling treated process wastewater effluent as cooling water does not constitute use of a cooling water intake structure for the purposes of this chapter.

(6) Whether the amount of water used exclusively for cooling at a given facility exceeds the 25 percent threshold shall be determined as follows:

(a) A new facility exceeds the 25 percent cooling water threshold if, based on the new facility's design, any monthly average over a year for the percentage of cooling water withdrawn is expected to equal or exceed 25 percent of the total water withdrawn.

(b) An existing facility or a new unit at an existing facility exceeds the 25 percent cooling water threshold if, on an actual intake flow basis as defined in s. NR 111.03 (1), at least 25 percent of water withdrawn is used for cooling purposes.

(7) A facility with an intake structure not subject to the requirements of this chapter as provided in sub. (2) shall meet requirements established by the department on a case-by-case, best professional judgment basis, as specified in s. 283.31, Stats.

NR 111.03 Definitions. In this chapter:

(1) "Actual intake flow," or "AIF," means the average volume of water withdrawn on an annual basis by the cooling water intake structures over the past 3 years. After October 14,

2019, "actual intake flow" means the average volume of water withdrawn on an annual basis by the cooling water intake structures over the previous 5 years. AIF is measured at a location within the cooling water intake structure that the department deems appropriate. The calculation of AIF includes days of zero flow. AIF does not include flows associated with emergency and fire suppression capacity.

(2) "All life stages of fish and shellfish" means eggs, larvae, juveniles, and adults. "All life stages of fish and shellfish" does not include nuisance species.

(3) "Annual mean flow" means the average of daily flows over a calendar year, calculated using historical data up to 10 years when available.

(4) "BTA" means best technology available for minimizing adverse environmental impact associated with a cooling water intake structure.

(5)

(a) At existing facilities, "closed-cycle recirculating system" means a system designed and properly operated, using minimized make-up and blowdown flows withdrawn from a surface water of the state to support contact or non-contact cooling uses within a facility, or a system designed to include certain impoundments, that operates by passing cooling water through a condenser and other components of the cooling system and reuses the water for cooling multiple times. "Closed-cycle recirculating system" includes all of the following:

1. A facility with wet, dry, or hybrid cooling towers, a system of impoundments that are not waters of the state, or any combination thereof. A properly operated and maintained closed-cycle recirculating system withdraws new source water, or make-up water, only to replenish losses that have occurred due to blowdown, drift, and evaporation. If surface waters of the state are withdrawn for the purposes of replenishing losses to a closed-cycle recirculating system other than those due to blowdown, drift, and evaporation from the cooling system, the department may determine that a cooling system is a closed-cycle recirculating system if the facility demonstrates to the satisfaction of the department that make-up water withdrawal attributed specifically to the cooling portion of the cooling system has been minimized.

2. A system with impoundments of waters of the state where the impoundment was constructed prior to October 14, 2014 and created for the purpose of serving as part of the cooling water system as documented in the project purpose statement for any required federal clean water act section 404 permit obtained to construct the impoundment. In the case of an

impoundment whose construction pre-dated the clean water act requirement to obtain a section 404 permit, documentation of the project's purpose shall be demonstrated to the satisfaction of the department. This documentation may be some other license or permit obtained to lawfully construct the impoundment for the purposes of a cooling water system or other such evidence as the department finds necessary. For impoundments constructed in uplands or not in waters of the state, no documentation of a section 404 or other permit is required.

(b) At new facilities, "closed-cycle recirculating system" means a system to described as follows:

1. It is designed, using minimized makeup and blowdown flows, to withdraw water from a natural or other water source to support contact cooling uses, noncontact cooling uses, or both within a facility.

2. The water is usually sent to a cooling canal or channel, lake, pond, or tower to allow waste heat to be dissipated to the atmosphere and then is returned to the system.

3. Waste heat may be diverted to other process operations.

4. New source water, or make-up water, is added to the system to replenish losses that have occurred due to blowdown, drift, and evaporation.

(6) "Cooling water" means water used for contact or non-contact cooling, including water used for equipment cooling, evaporative cooling tower make-up, and dilution of effluent heat content. Cooling water is water intended to absorb waste heat rejected from the process or processes used, or from auxiliary operations on the facility's premises. For the purposes of calculating the percentage of a facility's intake flow that is used for cooling purposes as defined in s. NR 111.02 (6), water obtained from a public water system, reclaimed water from a wastewater treatment facility, treated effluent from a manufacturing facility, or cooling water that is used in a manufacturing process either before or after it is used for cooling is not considered "cooling water."

(7) "Cooling water intake structure" means the total physical structure and any associated constructed waterways used to withdraw cooling water from waters of the state. The cooling water intake structure extends from the point at which water is withdrawn from waters of the state up to, and including, the intake pumps.

(8) "Department" means the department of natural resources.

(9)

(a) At an existing facility:

1. "Design intake flow" or "DIF" means the value assigned during the cooling water intake structure design to the maximum instantaneous rate of flow of water the cooling water intake system is capable of withdrawing from a source waterbody. The facility's DIF may be adjusted to reflect permanent changes to the maximum capabilities of the cooling water intake system to withdraw cooling water, including pumps permanently removed from service, flow limit devices, and physical limitations of the piping. "Design intake flow" or "DIF" does not include values associated with emergency and fire suppression capacity or redundant pumps, such as back-up pumps.

(b) At a new facility, "design intake flow" or DIF means the value assigned during the facility's design to the total volume of water withdrawn from a source waterbody over a specific time period.

(10) "Design intake velocity" means the value assigned during the design of a cooling water intake structure to the average speed at which intake water passes through the open area of the intake screen, inlet, or other device against which organisms might be impinged or through which they might be entrained. This definition applies only to intakes at new facilities.

Note: See sub. (26) for the definition of "maximum design intake velocity".

(11) "Entrainable organisms" means any life stages of fish and shellfish that are potentially subject to entrainment but does not include organisms that are collected or retained by a sieve with a maximum opening dimension of 0.56 inches.

Note: Examples of sieves that would be included as having an opening dimension of 0.56 inches or less include a 3/8 inch square mesh or a 1/2 inch by 1/4 inch mesh.

(12) "Entrainment" means the entrance and passing through into a cooling water intake structure and into a cooling water system, including the condenser or heat exchanger, of entrainable organisms. A facility shall use the same mesh size when counting entrainment as is used when counting impingement.

(13) "Entrainment mortality" means death as a result of entrainment through the cooling water intake structure, or death as a result of exclusion from the cooling water intake structure by fine mesh screens or other protective devices intended to prevent the passage of entrainable organisms through the cooling water intake structure.

(14) "Entrapment" means the condition in which impingeable fish and shellfish lack the means to escape the cooling water intake. "Entrapment" includes the conditions in which organisms are caught in the bucket of a traveling screen and unable to reach a fish return, caught in the forebay of a cooling water intake system without any means of being returned to the source waterbody without experiencing mortality, or caught in a cooling water intake system where the velocities in the intake pipes or in any channels leading to the forebay prevent the organisms from being able to return to the source waterbody through the intake pipe or channel.

(15) "Existing facility" means a facility determined to be an existing facility under s. NR 111.02 (3).

(16) "Facility" means any WPDES point source as defined in s. 283.01 (12), Stats. or any other facility or activity that is subject to regulation under the WPDES program.

(17) "Flow reduction" means any modification to a cooling water intake structure or its operation that serves to reduce the volume of cooling water withdrawn.

Note: Examples of flow reduction include variable speed pumps, seasonal flow reductions, wet cooling towers, dry cooling towers, hybrid cooling towers, unit closures, or substitution for withdrawals by reuse of effluent from a nearby facility.

(18) "Fragile species" means those species of fish and shellfish with an impingement survival rate less than 30 percent, including alewife, gizzard shad, rainbow smelt, and any other species deemed fragile by the department.

(19) "Hydraulic zone of influence" means the portion of the source waterbody hydraulically affected by the cooling water intake structure withdrawal of water.

(20) "Impingement" means the entrapment of any life stages of fish and shellfish on the outer part of an intake structure or against a screening device during periods of intake water withdrawal. Impingement includes those organisms collected or retained on a sieve with maximum distance in the opening of 0.56 inches and excludes those organisms that pass through the sieve. The owner or operator of a facility shall use a sieve with the same mesh size when counting entrainment as is used when counting impingement.

Note: This definition is intended to prevent the conversion of entrainable organisms to counts of impingement or impingement mortality.

(21) "Impingement mortality" means death as a result of impingement. "Impingement mortality" also includes the inevitable mortality of organisms due to their removal from their natural ecosystem and lack of ability to escape the cooling water intake system.

(22) "Independent supplier" means an entity, other than the regulated facility, that owns and operates its own cooling water intake structure; directly withdraws water from waters of the state; and provides the cooling water to other facilities for their use, regardless of whether the entity also retains a portion of the water for its own use. "Independent supplier" does not include an entity that provides potable water to residential populations such as a public water system.

(23) "Lake or reservoir" means any inland body of open water with some minimum surface area free of rooted vegetation and with an average hydraulic retention time of more than 7 days. "Lake or reservoir" includes a flow-through reservoir with an average hydraulic retention time of greater than 7 days.

Note: Lakes or reservoirs might be natural waterbodies or impounded streams, surrounded by land or by land and a man-made retainer, such as a dam. Lakes or reservoirs might be fed by rivers, streams, springs, or local precipitation.

(24) "Latent mortality" means the delayed mortality of organisms that were initially alive upon being impinged or entrained but that do not survive the delayed effects of impingement and entrainment during an extended holding period. "Delayed effects of impingement and entrainment" includes temperature change, physical stress, and chemical stress.

(25) "Maximize" means to increase to the greatest amount, extent, or degree reasonably possible.

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

$$V = \frac{Q}{A * P}$$

where:

V = the maximum design intake velocity.

Q = the maximum volumetric flow rate based on pump capacities, excluding emergency and redundant pumps.

A = typical wetted area of the screen at $Q_{7,10}$ flows.

P = screen open area percentage divided by 100.

(27) "MGD" means millions of gallons per day.

(28) "Minimize" means to reduce to the smallest amount, extent, or degree reasonably possible.

(29) "Modified traveling screen" means a traveling water screen that incorporates measures protective of fish and shellfish, including all of the following:

(a) A screen with a collection bucket or an equivalent mechanism designed to minimize turbulence to aquatic life.

(b) The addition of a guard rail or barrier to prevent loss of fish from the collection system or the replacement of screen panel materials with smooth woven mesh, drilled mesh, molded mesh, or similar materials that protect fish from descaling and other abrasive injury.

(c) The continuous or near-continuous rotation of screens and operation of fish collection equipment to ensure any impinged organisms are recovered as soon as practical.

(d) A low pressure wash or gentle vacuum to remove fish prior to any high pressure spray to remove debris from the screens.

(e) A fish handling and return system with sufficient water flow to return the fish directly to the source water in a manner that does not promote predation or re-impingement of the fish or require a large vertical drop. The department may approve of fish being returned to water sources other than the original source water, taking into account any recommendations from the U.S. fish and wildlife service with respect to endangered or threatened species.

Note: Examples of modified traveling screens include Modified Ristroph screens with a fish handling and return system, dual flow screens with smooth mesh, and rotary screens with fish returns or vacuum returns.

(30) "Moribund" means dying or close to death.

(31) "Natural thermal stratification" means the naturally occurring division of a waterbody into horizontal layers of differing densities as a result of variations in the temperature at different depths.

(32) "New facility" means a facility determined to be a new facility under s. NR 111.02 (3).

Note: Examples of new facilities are provided in 40 CFR 125.83. This definition is intended to be equivalent to the definition of "new facility" in 40 CFR 125.83.

(33) "New unit" means a new stand-alone unit at an existing facility on which construction began after October 14, 2014 and that is not otherwise classified as a new facility under s. NR 111.02 (3) or that is not otherwise already subject to subch. III, regardless of whether it has its own dedicated cooling water intake structure or uses an existing one. In this subsection, "stand-alone unit" means a separate unit that is added to a facility for either the same general industrial operation or another purpose.

Note: A new unit may have its own dedicated cooling water intake structure, or the new unit may use an existing or modified cooling water intake structure.

(34) "Nuisance species" means common carp (*Cyprinus carpio*), grass carp (*Ctenopharyngodon idella*), silver carp (*Hypophthalmichthys molitrix*), bighead carp (*Aristichthys nobilis*), black carp (*Mylopharyngodon piceus*), goldfish (*Carassius auratus*), sea lamprey (*Petromyzon marinus*), alewife (*Alosa pseudoharengus*), rainbow smelt (*Osmerus mordax*), threespine stickleback (*Gasterosteus aculeatus*), white perch (*Morone americana*), ruffe (*Gymnocephalus cernuus*), tubenose goby (*Proterorhinus marmoratus*), round goby (*Apollonia melanostomus*), rusty crayfish (*Orocnectes rusticus*), red swamp crayfish (*Procambarus clarkii*), the species listed in ss. NR 40.04 (2) (c) and 40.05 (2) (c), the shellfish species listed in ss. NR 40.04 (2) (d) and 40.05 (2) (d), and any species subsequently added by the department. "Nuisance species" also includes the species designated by the department as detrimental in the water of the state specified in s. NR 20.38.

(35) "Offshore velocity cap" means an open intake designed to change the direction of water withdrawal from vertical to horizontal, thereby creating horizontal velocity patterns that result in avoidance of the intake by fish and other aquatic organisms, and that satisfies all of the following:

(a) It is located 800 feet or more from the shoreline.

(b) It uses bar screens or otherwise excludes large aquatic organisms.

(36) "Operational measure" means a modification to any operation that serves to minimize impact to all life stages of fish and shellfish from the cooling water intake structure.

Note: Examples of "operational measures" include more frequent rotation of traveling screens, use of a low pressure wash to remove fish prior to any high pressure spray to remove debris, maintaining adequate volume of water in a fish return, and debris minimization measures such as air sparging of intake screens or other measures taken to maintain the design intake velocity.

(37) "River or stream" means a lotic, or free-flowing, system. "River or stream" includes a flow-through reservoir with a retention time of 7 days or less.

(38) "$Q_{7,10}$ flow" means the average minimum 7-day low streamflow which occurs once in 10 years

(39) "Social benefits" means the increase in social welfare, including physical and biological effects on the environment, that results from taking an action. "Social benefits" includes private benefits and those benefits not taken into consideration by private decision makers in the actions they choose to take, including effects occurring in the future. Benefits are generally treated one or more of 3 ways: A narrative containing a qualitative discussion of environmental effects, a quantified analysis expressed in physical or biological units, and a monetized benefits analysis in which dollar values are applied to quantified physical or biological units. The dollar values in a social benefits analysis are based on the principle of willingness-to-pay, which captures monetary benefits by measuring what individuals are willing to forgo in order to enjoy a particular benefit. Willingness-to-pay for nonuse values can be measured using benefits transfer or a stated preference survey.

(40) "Social costs" means costs estimated from the viewpoint of society, rather than individual stakeholders, representing the total burden imposed on the economy and consisting of the sum of all opportunity costs incurred associated with taking actions. "Opportunity costs" means the value lost to society of all the goods and services that will not be produced and consumed as a facility complies with permit requirements, and society reallocates resources away from other production activities and toward minimizing adverse environmental impacts.

(41) "Source water" means the water of the state from which the cooling water is withdrawn.

(42) "Thermocline" means the middle layer of a thermally stratified lake or reservoir where there is a rapid decrease in temperatures.

(43) "Threatened and endangered species" means all species listed in s. NR 27.03.

(44) "WPDES" means the Wisconsin pollutant discharge elimination system.

SUBCHAPTER II
EXISTING FACILITIES

NR 111.10 Requirement to comply with BTA standards.

(1) The owner or operator of an existing facility that meets the applicability criteria specified in s. NR 111.02 shall at a minimum do all of the following:

(a) Comply with the BTA standards for impingement mortality under s. NR 111.12 and entrainment under s. NR 111.13, including any measures to protect threatened and endangered species and designated critical habitat established under ss. NR 111.11 (2) (a) and 111.16.

(b) Submit and retain a permit application and supporting information as specified in s. NR 111.40 (2).

(c) Conduct compliance monitoring as specified in s. NR 111.14.

(d) Report information and data and keep records as specified in s. NR 111.15.

(2) The requirements specified in sub. (1) shall be implemented through a WPDES permit for each facility subject to this subchapter. Based on the information submitted in the permit application, the department shall determine the requirements and conditions to include in the permit.

NR 111.11 Timing of BTA determinations.

(1) PERMIT APPLICATION SUBMITTAL TIMEFRAMES.

(a) *Permits expiring after July 14, 2018*. The owner or operator of an existing facility whose currently effective permit expires after July 14, 2018 shall submit to the department the information required in the applicable provisions of subch. V when applying for a subsequent permit.

(b) *Permits expiring on or after October 14, 2014 and prior to or on July 14, 2018.* The owner or operator of a facility whose currently effective permit expires on or after October 14, 2014 and prior to or on July 14, 2018 may request that the department establish an alternate schedule for the submission of the information required under subch. V when applying for a subsequent permit. If the owner or operator of the facility demonstrates that it cannot develop

the required information by the applicable date for submission, the department shall establish an alternate schedule for submission of the required information.

(2) TIMELINE FOR PERMIT REQUIREMENTS.

(a) *Reissuance of permits that expired after July 14, 2018 and permits that expired on or prior to July 14, 2018 that did not receive an alternate schedule*. In the case of reissuance of any permit that expired after July 14, 2018 and in the case of reissuance of any permits expiring on or prior to July 14, 2018 that did not receive an alternate schedule under sub. (1) (b), the department shall include in the reissued permit, at a minimum, conditions to implement and ensure compliance with the impingement mortality standard specified in s. NR 111.12 and the entrainment standard specified in s. NR 111.13, including any measures to protect threatened and endangered species and designated critical habitat required by the department. In addition, the department shall include in the permit conditions, management practices, and operational measures necessary to ensure proper operation of any technology used to comply with these standards.

(b) *Permits receiving an alternate schedule*. In the case of any permit for which the department, under sub. (1) (b), has established an alternate schedule for submission of the information required under subch. V, the department may include permit conditions to ensure that, for any subsequent permit, the department has all the information required under subch. V necessary to establish impingement mortality and entrainment BTA requirements under ss. NR 111.12 and 111.13. In addition, the department shall establish interim BTA requirements in the permit based on the department's best professional judgment on a site-specific basis.

(c) *Permits issued after October 14, 2014 and applied for before October 14, 2014.*

1. In the case of any permit issued after October 14, 2014 and applied for before October 14, 2014, the department may include permit conditions to ensure that the department has all the information under subch. V necessary to establish impingement mortality and entrainment BTA requirements under ss. NR 111.12 and 111.13 for the subsequent permit. The department shall establish interim BTA requirements in the permit on a site-specific basis based on the department's best professional judgment.

2. In the case of permit proceedings that have begun prior to October 14, 2014, whenever the department has determined that the information already submitted by the owner or operator of the facility is sufficient, the department may proceed with a determination of BTA standards

for impingement mortality and entrainment without requiring the owner or operator of the facility to submit the information required under subch. V. The department's BTA determination may be based on some or all of the factors specified in s. NR 111.13 (2) and (3) and the BTA standards for impingement mortality specified in s. NR 111.12. In making the decision on whether to require additional information from the applicant, and what BTA requirements to include in the applicant's permit for impingement mortality and site-specific entrainment, the department shall consider whether any of the information under subch. V is necessary.

(3) PERMIT SCHEDULES FOR COMPLIANCE. (a) *Generally.* After issuance of a final permit establishing the entrainment requirements under s. NR 111.13, the owner or operator of an existing facility shall comply with the impingement mortality and entrainment standards as soon as practicable, based on a schedule of requirements established by the department. The department may establish interim compliance milestones in the permit.

(b) *Electric power generating facilities.* When establishing a schedule under par. (a) for an electric generating facility, the department may consider measures to maintain adequate energy reliability and necessary grid reserve capacity during any facility outage. These may include establishing a staggered schedule for multiple facilities serving the same localities. The department may confer with independent system operators and state public utility regulatory agencies when establishing a schedule for electric power generating facilities.

(c) *Manufacturing facilities.* The department may consider extenuating circumstances, such as lengthy scheduled shutdowns or future production schedules, in establishing a compliance schedule under par. (a) for any manufacturing facility.

NR 111.12 Impingement mortality BTA standards. (1) MANDATORY REQUIREMENTS. (a) *Generally.* Except when approved by the department as provided in par. (b) and subs. (3) and (4), the owner or operator of an existing facility shall comply with one of the following alternatives, subject to the additional requirements specified in sub. (2) or s. NR 111.16 (1) if the department requires such additional measures:

1. 'Closed cycle recirculating system.' Operate a closed-cycle recirculating system as defined in s. NR 111.03 (5). In addition, the facility shall monitor the actual intake flows at a minimum frequency of daily. The monitoring shall be representative of normal operating

conditions and shall include measuring cooling water withdrawals, make-up water, and blowdown volume. In lieu of daily intake flow monitoring, a facility may monitor cycles of concentration at a minimum frequency of daily.

2. '0.5 Feet per second maximum design intake velocity.' Operate a cooling water intake structure that has a maximum design intake velocity less than or equal to 0.5 feet per second. The owner or operator of the facility shall submit information to the department that demonstrates that the maximum design intake velocity does not exceed 0.5 feet per second. The maximum velocity shall be achieved under all conditions, including during source water surface elevations associated with $Q_{7,10}$ flows and during periods of maximum head loss across the screens or other devices during normal operation of the intake structure. The maximum design intake velocity shall be calculated using the equation specified in s. NR 111.03 (26).

3. '0.5 Feet per second actual intake velocity.' Operate a cooling water intake structure that has a maximum intake velocity less than or equal to 0.5 feet per second. The owner or operator of the facility shall submit information to the department that demonstrates that the maximum actual intake velocity does not exceed 0.5 feet per second at the point with the smallest open area between the point at which water is withdrawn from a water of the state and the first screen. The maximum velocity shall be achieved under all conditions, including during source water surface elevations associated with $Q_{7,10}$ flows and during periods of maximum head loss across the screens or other devices during normal operation of the intake structure. The department may authorize the permittee to exceed the 0.5 feet per second velocity at an intake for brief periods for the purpose of maintaining the cooling water intake system, such as backwashing the screen face. In addition, the permittee shall monitor the velocity at the intake continuously and report any exceedances of 0.5 feet per second. In lieu of velocity monitoring at the intake, the permittee may calculate the actual intake velocity as follows:

$$V = \frac{Q}{A * P}$$

where:

V = the actual intake velocity.

Q = the actual intake flow rate based on monitoring.

A = wetted area of the screen at the given water depth.

P = screen open area percentage divided by 100.

4. 'Existing offshore velocity cap.' Operate an existing offshore velocity cap that was installed on or before October 14, 2014. Offshore velocity caps installed after October 14, 2014 shall make either a demonstration under subd. 6. or meet the performance standard under subd. 7. In addition, the facility shall monitor total daily intake flow.

5. 'Modified traveling screens.' A facility shall operate a modified traveling screen that the department determines meets the definition specified in s. NR 111.03 (29) and that, after review of the information required in the impingement technology performance optimization study specified in s. NR 111.41 (5), the department determines is the BTA for impingement reduction at the site. As the basis for the department's determination, the owner or operator of the facility shall demonstrate that the technology is or will be optimized to minimize impingement mortality of all species except those designated as fragile or nuisance. The permit shall include verifiable and enforceable permit conditions that ensure the technology will perform as demonstrated.

6. 'Systems of technologies as the BTA for impingement mortality.' Operate a system of technologies, management practices, and operational measures that, after review of the information required in the impingement technology performance optimization study specified in s. NR 111.41 (5), the department determines is the BTA for impingement reduction at the facility's cooling water intake structure. As the basis for the department's determination, the permittee shall demonstrate that the system of technologies has been optimized to minimize impingement mortality of all species except those designated as fragile or nuisance. In addition, the department's decision will be informed by comparing the impingement mortality performance data under s. NR 111.41 (5) to a performance standard of no more than 24 percent impingement mortality, including latent mortality and excluding fragile and nuisance species. The permit shall include verifiable and enforceable permit conditions that ensure the system of technologies will perform as demonstrated.

7. 'Impingement mortality performance standard.' Achieve a 12-month impingement mortality performance standard of all life stages of fish and shellfish of no more than 24 percent mortality, including latent mortality, for all species together, except those designated as fragile or nuisance, that are collected or retained in a sieve with maximum opening dimension of 0.56 inches and kept for a holding period of 18 to 96 hours. The department may prescribe an alternative holding period. The facility shall conduct biological monitoring at a minimum

frequency of monthly to demonstrate its impingement mortality performance. Each month, the facility shall use all of the monitoring data collected during the previous 12 months to calculate the 12-month survival percentage. The 12-month impingement mortality survival performance standard is the total number of fish killed divided by the total number of fish impinged over the course of the entire 12 months. The permittee shall choose whether to demonstrate compliance with this requirement for the entire facility, or for each individual cooling water intake structure for which this subsection is the selected impingement mortality requirement.

(b) *Exceptions.* 1. 'De minimis rate of impingement.' In limited circumstances, rates of impingement may be so low at a facility that additional impingement controls may not be justified. The department, based on review of site-specific data submitted under subch. V, may conclude that the documented rate of impingement at the cooling water intake is so low that no additional controls are warranted. Notice of a determination that no additional impingement controls are warranted shall be included in the draft or proposed permit and the department's response to all comments on this determination shall be included in the record for the final permit.

2. 'Low capacity utilization power generating units.' If an existing facility has a cooling water intake structure used for one or more existing electric generating units, each with an annual average capacity utilization rate of less than 8 percent averaged over a 24-month contiguous period, the department may, based on review of site-specific data concerning cooling water system data under s. NR 111.41 (4), establish the BTA standards for impingement mortality for that cooling water intake structure that are less stringent than par. (a) 1. to 7.

(c) *Reuse of other water for cooling purposes.* The impingement mortality standard under this section does not apply to the portion of cooling water that is process water, graywater, reclaimed water, or other waters reused as cooling water in lieu of water obtained by surface water intakes.

(2) ADDITIONAL MEASURES FOR OTHER SPECIES. The department may require the permittee to comply with additional monitoring, technologies, or measures, such as seasonal deployment of barrier nets, to protect shellfish or fragile species.

(3) BEST PROFESSIONAL JUDGMENT-BASED BTA REQUIREMENTS. A permittee may be subject to interim, best professional judgment-based BTA requirements established by the department in the permit on a site-specific basis if an alternative schedule is granted under s. NR

111.11 (2) (b) or if a complete permit application was received by the department before October 14, 2014.

(4) NUCLEAR FACILITIES. If the owner or operator of a nuclear facility demonstrates to the department, upon the department's consultation with the U.S. nuclear regulatory commission, the U.S. department of energy, or the naval nuclear propulsion program, that compliance with this subchapter would result in a conflict with a safety requirement established by the U.S. nuclear regulatory commission, U.S. department of energy, or naval nuclear propulsion program, the department shall make a site-specific determination of BTA for minimizing adverse environmental impact that would not result in a conflict with the safety requirement of the U.S. nuclear regulatory commission, U.S. department of energy, or naval nuclear propulsion program.

NR 111.13 Entrainment BTA standards. The department shall establish BTA standards for entrainment for each intake on a site-specific basis. These standards shall reflect the department's determination of the maximum reduction in entrainment warranted after consideration of the relevant factors as specified in subs. (2) and (3). The department may also require periodic reporting on a facility's progress toward installation and operation of site-specific entrainment controls. These reports may include updates on planning, design, and construction or other appropriate topics as required by the department. If the department determines that the site-specific BTA standard for entrainment under this section requires performance equivalent to a closed-cycle recirculating system as defined in s. NR 111.03 (5), then the facility in question shall comply with the impingement mortality standard under s. NR 111.12 (1) (a) 1. for that intake. The department shall follow all of the following steps to establish BTA standards for entrainment:

(1) The department shall provide a written explanation of the proposed entrainment determination in the fact sheet for the proposed permit. The written explanation shall describe why the department has rejected any entrainment control technologies or measures that perform better than the selected technologies or measures and shall reflect consideration of all reasonable attempts to mitigate any adverse impacts of otherwise available better performing entrainment technologies.

(2) (a) The department's BTA determination shall be based on consideration of all of the following factors, plus any additional information required by the department, such as that listed in sub. (3):

1. Numbers and types of organisms entrained, including, specifically, the numbers and species, or lowest taxonomic classification possible, of threatened and endangered species and designated critical habitat, for example, prey base.

2. Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

3. Land availability as it relates to the feasibility of entrainment technology.

4. Remaining useful plant life.

5. Quantified and qualitative social benefits and costs of available entrainment technologies when information on both benefits and costs is of sufficient rigor to make a decision.

(b) The weight given to each factor under par. (a) is within the department's discretion based upon the circumstances of each facility.

(3) The department's proposed BTA determination may be based on consideration of any of the following factors to the extent the applicant submitted information under subch. V:

(a) Entrainment impacts on the waterbody.

(b) Thermal discharge impacts.

(c) Credit for reductions in flow associated with the retirement of units occurring within 10 years preceding October 14, 2014.

(d) Impacts on the reliability of energy delivery within the immediate area.

(e) Impacts on water consumption.

(f) Availability of process water, graywater, wastewater, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.

(4) If all technologies considered have social costs not justified by the social benefits, or have unacceptable adverse impacts that cannot be mitigated, the department may determine that no additional control requirements are necessary beyond those already in use at the facility. The department may reject an otherwise available technology as a BTA standard for entrainment if the social costs are not justified by the social benefits.

(5) Prior to any permit reissuance after July 14, 2018, the department shall review the performance of the facility's installed entrainment technology to determine whether it continues to meet the requirements of this section.

NR 111.14 Monitoring requirements. At a minimum, the WPDES permit for a facility subject to this subchapter shall require the permittee to monitor, as required in ss. NR 111.12, and 111.13, according to all of the following:

(1) MONITORING REQUIREMENTS FOR IMPINGEMENT MORTALITY. The department may establish monitoring requirements to quantify impingement mortality in addition to those specified in s. NR 111.12, including biological monitoring, intake velocity, and flow measurements. If the department establishes additional monitoring requirements, the specific protocols shall be determined by the department.

(2) MONITORING REQUIREMENTS FOR ENTRAINMENT. The department shall determine monitoring requirements for entrainment on a site-specific basis, as appropriate, to meet requirements under s. NR 111.13. The department may establish entrainment monitoring requirements in addition to those specified in s. NR 111.13.

(3) FLOW RATE MONITORING. The permittee shall monitor the total volume of water withdrawn and the percent used for cooling on a daily basis. Additionally, if applicable, make-up water and blowdown daily flow rates shall be monitored. Alternatively, permittees complying with s. NR 111.12 (1) (a) 1. may monitor cycles of cooling in lieu of flow monitoring. The department may require additional monitoring as necessary to demonstrate compliance with s. NR 111.21.

(4) VISUAL OR REMOTE INSPECTIONS. A facility shall conduct either visual inspections or employ remote monitoring devices during the period the cooling water intake structure is in operation. A facility shall conduct inspections at least weekly to ensure that any technologies operated to comply with ss. NR 111.12, 111.13, and 111.16 are maintained and operated to function as designed. The department may establish alternative procedures if this requirement is not feasible, such as in the cases of offshore intakes, velocity caps, intakes inside dams, or monitoring during periods of inclement weather.

(5) REQUEST FOR REDUCED MONITORING. For a facility that is subject to s. NR 111.12 (1)

(a) 7. and where the facility's cooling water intake structure does not directly or indirectly affect threatened or endangered species or designated critical habitat, the owner or operator of the facility may request that the department reduce monitoring requirements after the first full permit term in which these monitoring requirements are implemented, on the condition that the results of the monitoring to date demonstrate that the owner or operator of the facility has consistently operated the intake as designed and is meeting the requirements specified in s. NR 111.12.

(6) ADDITIONAL MONITORING RELATED TO THREATENED AND ENDANGERED SPECIES AND DESIGNATED CRITICAL HABITAT. When the department requires additional measures to protect threatened or endangered species or designated critical habitat under s. NR 111.16, the department shall require monitoring associated with those measures.

NR 111.15 Recordkeeping and reporting requirements. The owner or operator of an existing facility subject to this subchapter is subject to all of the following requirements:

(1) REPORTING REQUIREMENTS. To submit to the department all of the following information:

(a) *Monitoring reports.* Discharge monitoring reports and results of all monitoring, demonstrations, and other information required by the permit sufficient to determine compliance with the permit conditions and requirements established under ss. NR 111.12 to 111.14.

(b) *Status reports.* Any reports required under ss. NR 111.12 to 111.14.

(c) *Annual certification statement and report*. An annual certification statement signed in accordance with NR 205.07 (1) (g) subject to the following:

1. If the information contained in the previous year's annual certification is still pertinent, the facility may state this in a letter to the department. The letter, along with compliance with any applicable data submission requirements specified in this section, shall constitute the annual certification.

2. If the facility has substantially modified operation of any unit that impacts cooling water withdrawals or operation of the cooling water intake structures, the facility shall provide a summary of those changes in the report. In addition, the facility shall submit revisions to the information required under subch. V in the next permit application.

(d) *Reporting.* The department may require additional reporting when necessary to establish permit compliance, including the records required under sub. (2), and may provide for periodic inspection of the facility.

(e) *Additional reporting requirements related to threatened and endangered species or designated critical habitat*. When the department requires additional measures to protect threatened or endangered species or critical habitat under s. NR 111.16, the department shall require reporting associated with those measures. The department shall submit the reports at least annually to the U.S. environmental protection agency region 5 office for compilation and transmittal to the U.S. fish and wildlife service.

(2) RECORDS RETENTION. A facility shall retain records of all submissions that are part of the permit reporting requirements under this section until the subsequent permit is issued. In addition, the department may require supplemental recordkeeping, such as for compliance monitoring under s. NR 111.14 or supplemental data collection under subch. V.

NR 111.16 Protection of threatened and endangered species.

(1) PROTECTION OF THREATENED AND ENDANGERED SPECIES AND CRITICAL HABITAT. A WPDES permit for a facility subject to this chapter may include additional control measures, monitoring requirements, and reporting requirements that are designed to minimize incidental take, reduce or remove more than minor detrimental effects to threatened and endangered species and designated critical habitat, or avoid jeopardizing threatened and endangered species or destroying or adversely modifying designated critical habitat, for example prey base. The control measures, monitoring requirements, and reporting requirements may include measures or requirements identified by the U.S. fish and wildlife service during the 60-day review period under sub. (3) or the public notice and comment period. When established in the permit by the department, the owner or operator shall implement any such requirements. The department may include the additional permit requirements if at least one of the following applies:

(a) Based on information submitted to the department by any fishery management agency or other relevant information, there are migratory, sport, or commercial species subject to entrainment that may be directly or indirectly affected by the cooling water intake structure.

(b) It is determined by the department, based on information submitted by any fishery management agencies or other relevant information, that operation of the facility, after meeting

the entrainment standard of this section, would still result in undesirable cumulative stressors to listed and proposed threatened and endangered species, and designated and proposed critical habitat.

(2) SUPPLEMENTAL TECHNOLOGIES AND MONITORING. The department may require additional technologies for protection of fragile species and may require additional monitoring of species of fish and shellfish not already required under s. NR 111.42 (1). The department may consider data submitted by other interested parties. The department may also require additional study and monitoring if a threatened or endangered species has been identified in the vicinity of the intake.

(3) U.S. FISH AND WILDLIFE SERVICE REVIEW. The department shall transmit all permit applications for facilities subject to this subchapter to the appropriate field office of the U.S. fish and wildlife service upon receipt for a 60-day review prior to public notice of the draft or proposed permit. The department shall provide the public notice and an opportunity to comment as required under s. 283.39, Stats., and shall submit a copy of the fact sheet, the permit application, and the draft permit to the appropriate field office of the U.S. fish and wildlife service. This includes notice of specific cooling water intake structure requirements, notice of the draft permit, and any specific information the department has about threatened or endangered species and critical habitat that are or may be present in the action area, including any proposed control measures and monitoring and reporting requirements for the species and habitat.

(4) TAKE DISCLAIMER. (a) Nothing in this chapter authorizes take, as defined in 16 USC 1532(19), of threatened or endangered species of fish or wildlife. Such take is prohibited under the federal endangered species act unless it is exempted under 16 USC 1536 (o) or permitted under 16 USC 1539 (a). Absent an exemption or permit, any facility operating under the authority of this regulation may not take threatened or endangered wildlife.

(b) Permits for facilities with cooling water intake structures shall include the following language as a permit condition: "Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act."

SUBCHAPTER III
NEW FACILITIES

NR 111.20 Requirement to comply with performance standards.

(1) The owner or operator of a new facility that meets the applicability criteria under s. NR 111.02 shall, at a minimum comply with all of the following:

(a) Adhere to track I or track II performance standards for impingement mortality and entrainment under s. NR 111.21 (2) (a) or (b), including any more stringent measures required under s. NR 111.21 (3). Less stringent standards may be approved as specified in s. NR 111.21 (4).

(b) Submit and retain permit application and supporting information as specified in s. NR 111.40 (1).

(c) Conduct compliance monitoring as specified in s. NR 111.22.

(d) Report information and data and keep records as specified in s. NR 111.23.

(2) The requirements specified in sub. (1) shall be implemented through a WPDES permit for each facility subject to this subchapter. Based on the information submitted in the permit application, the department shall determine the requirements and conditions to include in the permit.

NR 111.21 Performance standards. (1) GENERALLY. Based upon the information submitted by the permittee under s. NR 111.41 and on the track specified in sub. (2) (a) or (b) with which the permittee has chosen to comply, the department shall determine the appropriate requirements and conditions to include in the permit. At a minimum, the permit conditions shall include the applicable performance standards and requirements specified in sub. (2) (a) or (b), may include standards and requirements specified in sub. (3) and may include standards and requirements based on sub. (4) in lieu of those specified in subs. (1) to (3).

(2) TRACK I OR II REQUIREMENTS FOR NEW FACILITIES. A permittee shall, except as provided in sub. (4) and subject to sub. (3), comply with one of the following:

(a) *Track I requirements.* All of the following:

1. If the new facility will withdraw greater than or equal to 10 MGD DIF, the total design intake flow, at a minimum, shall be reduced to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system.

2. Each cooling water intake structure shall be designed and constructed to a maximum design intake velocity of 0.5 feet per second.

3. The cumulative DIF of all cooling water intake structures at the facility shall meet the following requirements:

a. For cooling water intake structures located in a river or stream, the total DIF shall be no greater than 5 percent of the source water annual mean flow.

b. For cooling water intake structures located in a lake or reservoir, the total DIF may not disrupt the natural thermal stratification or turnover pattern, where present, of the source water except in cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish by any fishery management agency. In determining whether or not disruption will occur, the department shall consider anthropogenic factors unrelated to the new facility's cooling water intake structure that can influence the occurrence and location of a thermocline, including source water inflows, other water withdrawals, managed water uses, wastewater discharges, and flow and level management practices.

4. The permittee shall select and implement design and construction technologies or operational measures for minimizing impingement mortality of fish and shellfish if any of the following occur:

a. Threatened, endangered, or otherwise protected federal, state, or tribal species or critical habitat for these species are present within the hydraulic zone of influence of the cooling water intake structure.

b. Based on information submitted by any fishery management agency or other relevant information, there are migratory, sport, or commercial species of impingement concern to the department that pass through the hydraulic zone of influence of the cooling water intake structure.

c. It is determined by the department, based on information submitted by any fishery management agency or other relevant information, that the proposed facility, after meeting the technology-based performance requirements specified in subds. 1. to 3., would still contribute unacceptable stress to the protected species, critical habitat of those species, or species of concern.

5. The permittee shall select and implement design and construction technologies or operational measures for minimizing entrainment of entrainable life stages of fish and shellfish if any of the following occur:

a. The new facility has not already reduced its design intake flow to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system.

b. There are threatened, endangered, or otherwise protected federal, state, or tribal species or critical habitat for these species within the hydraulic zone of influence of the cooling water intake structure.

c. Based on information submitted by any fishery management agency or other relevant information, there are, or will be upon commencement of operation, undesirable cumulative stressors affecting entrainable life stages of species of concern to the department and the department determines that the proposed facility, after meeting the technology-based performance requirements specified in subds. 1. to 3., would contribute unacceptable stress to the protected species, critical habitat of those species, or the species of concern.

(b) *Track II requirements.* All of the following:

1. The permittee shall demonstrate to the department that the technologies employed will reduce the level of adverse environmental impact from the cooling water intake structures to a level comparable to that which would be achieved were the permittee to implement the requirements specified in par. (a) 1. and 2. This demonstration shall include showing that the impacts to fish and shellfish, including important forage and predator species, within the watershed will be comparable to those that would result if the permittee were to implement the requirements specified in par. (a) 1. and 2. The department shall consider information provided by any fishery management agency and may also consider data and information from other sources.

2. The cumulative DIF of all cooling water intake structures at the facility shall meet the following requirements:

a. For cooling water intake structures located in a river or stream, the total DIF shall be no greater than 5 percent of the source water annual mean flow.

b. For cooling water intake structures located in a lake or reservoir, the total DIF shall not disrupt the natural thermal stratification or turnover pattern, where present, of the source water except in cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish by any fishery management agency. In determining whether or not disruption will occur, the department shall consider anthropogenic factors unrelated to the

new facility's cooling water intake structure that can influence the occurrence and location of a thermocline, including source water inflows, other water withdrawals, managed water uses, wastewater discharges, and flow and level management practices.

(3) MORE STRINGENT STANDARDS. The permittee shall comply with any requirements that are more stringent than those under sub. (2) relating to the location, design, construction, and capacity of a cooling water intake structure or monitoring requirements at a new facility that the department deems are necessary to comply with any provision of state law including applicable water quality standards.

(4) ALTERNATIVE REQUIREMENTS. Upon request, alternative requirements less stringent than those specified in subs. (2) and (3) may be imposed in the permit. The department may establish alternative less stringent requirements only if all of the following are demonstrated by the person requesting the alternative requirements:

(a) There is an applicable requirement under subs. (2) and (3).

(b) The department determines that data specific to the facility indicate that compliance with the requirement at issue would result in compliance costs wholly out of proportion to the costs U.S. environmental protection agency considered in establishing the requirement at issue or would result in significant adverse impacts on local air quality, local water resources other than impingement or entrainment, or local energy markets.

(c) The alternative requirement requested is no less stringent than justified by the wholly out of proportion cost or the significant adverse impacts on local air quality, local water resources other than impingement or entrainment, or local energy markets.

(d) The alternative requirement will ensure compliance with other applicable provisions of the federal clean water act and any applicable requirement of state or tribal law.

NR 111.22 Monitoring requirements. At a minimum, a permittee to which this subchapter applies shall perform all of the following monitoring:

(1) BIOLOGICAL MONITORING. (a) *Impingement and entrainment monitoring*. The permittee shall monitor both impingement and entrainment of the commercial, recreational, and forage base fish and shellfish species identified in either the source water baseline biological characterization data required under s. NR 111.41 (3) or the comprehensive demonstration study

required under s. NR 111.41 (19), depending on whether the permittee chooses to comply with s. NR 111.21 (2) (a) or (b).

(b) *Impingement and entrainment monitoring methods.* The monitoring methods used shall be consistent with those used for the source water baseline biological characterization data required under s. NR 111.41 (3) or the comprehensive demonstration study required under s. NR 111.41 (19).

(c) *Impingement and entrainment monitoring frequency.* The permittee shall monitor at the frequencies identified in pars. (d) to (f) for at least two years after the initial permit issuance. After that time, the department may approve a request for less frequent sampling in the remaining years of the permit term and when the permit is reissued, if the department determines the supporting data show that less frequent monitoring would still allow for the detection of any seasonal and daily variations in the species and numbers of individuals that are impinged or entrained.

(d) *Impingement sampling*. The permittee shall collect samples to monitor impingement rates for each species over a 24-hour period and no less than once per month when the cooling water intake structure is in operation.

(e) *Entrainment sampling*. The permittee shall collect samples at least every other week to monitor entrainment rates for each species over a 24-hour period during the primary period of reproduction, larval recruitment, and peak abundance, as identified by the department. Samples shall be collected only when the cooling water intake structure is in operation.

(f) *Authority to modify*. The department may modify the monitoring program when the permit is reissued and during the term of the permit based on changes in physical or biological conditions in the vicinity of the cooling water intake structure. The department may require continued monitoring based on the results of the verification monitoring plan in the track II comprehensive demonstration study required under s. NR 111.41 (19) (c) 3.

(2) VELOCITY MONITORING. A permittee using surface intake screen systems shall continuously monitor head loss across the screens and correlate the measured value with the design intake velocity. The head loss across the intake screen shall be measured at the minimum ambient source water surface elevation, based on the $Q_{7,10}$ flow or the department's best professional judgment and available hydrological data. The maximum head loss across the screen for each cooling water intake structure shall be used to determine compliance with the

velocity requirement specified in s. NR 111.21 (2) (a) 2. A permittee using devices other than surface intake screens shall monitor velocity at the point of entry through that device.

(3) FLOW RATE MONITORING. The permittee shall monitor the total volume of water withdrawn and the percent used for cooling on a daily basis. Additionally, if applicable, make-up water and blowdown daily flow rates shall be monitored. The department may require additional monitoring necessary to demonstrate compliance with s. NR 111.21.

(4) VISUAL OR REMOTE INSPECTIONS. The permittee shall either conduct visual inspections or employ remote monitoring devices during the period the cooling water intake structure is in operation. Such inspections shall be performed at least weekly to ensure that any design and construction technologies required in s. NR 111.21 are maintained and operated to ensure that they will continue to function as designed.

(5) TRACK II FACILITIES. Facilities that choose to comply with the track II requirements under s. NR 111.21 (2) (b) shall comply with the verification monitoring plan requirements specified in s. NR 111.41 (19) (c) 3.

NR 111.23 Recordkeeping and reporting requirements. At a minimum, the permittee shall report and keep records according to all of the following requirements:

(1) The permittee shall keep records of all the data used to complete the permit application and show compliance with the requirements, any supplemental information developed for the permit application materials, and any compliance monitoring data submitted under s. NR 111.22 for a period of at least 3 years from the date of permit issuance. The department may require that these records be kept for a longer period.

(2) The permittee shall provide all of the following information to the department in a yearly status report:

(a) Biological monitoring records for each cooling water intake structure as required under s. NR 111.22 (1).

(b) Velocity and head loss monitoring records for each cooling water intake structure as required under s. NR 111.22 (2).

(c) Records of visual or remote inspections as required under s. NR 111.22 (4).

NR 111.24 Review of design and construction technologies to minimize impingement mortality and entrainment.

(1) TRACK I. All of the following department actions are required for track I new facilities:

(a) The department shall review the information submitted under s. NR 111.41 (18) to evaluate the suitability and feasibility of the technology proposed to minimize impingement mortality and entrainment of all life stages of fish and shellfish.

(b) In the first permit issued to a new facility, the department shall include a condition requiring the facility to reduce impingement mortality and entrainment commensurate with the implementation of the technologies in the permit.

(c) In permit reissuances, the department shall review the performance of the technologies implemented and require additional or different technologies if needed to minimize impingement mortality and entrainment of all life stages of fish and shellfish.

(d) The department shall consider whether more stringent conditions are reasonably necessary in accordance with s. NR 111.21 (3).

(2) TRACK II. All of the following department actions are required for track II new facilities:

(a) The department shall review the information submitted under s. NR 111.41 (19) and evaluate the suitability of the proposed technologies and operational measures to determine whether or not they will reduce both impingement mortality and entrainment of all life stages of fish and shellfish to 90 percent or greater of the reduction that could be achieved through track I. If the department determines they do not, the permittee shall further reduce the level of adverse environmental impact from the cooling water intake structure to such a level before the permit may be issued.

(b) In permit reissuances, the department shall review the performance of the additional or different technologies or measures used and determine whether or not they reduce the level of adverse environmental impact from the cooling water intake structure to a comparable level that the facility would achieve were it to implement the requirements specified in s. NR 111.21 (2) (a) 1. and 2. If the department determines they do not, the permittee shall further reduce the level of adverse environmental impact from the cooling water intake structure to a comparable

level that the facility would achieve were it to implement the requirements specified in s. NR 111.21 (2) (a) 1. and 2.

NR 111.25 Timing.

(1) COMPLIANCE. The permittee shall comply with the requirements specified in s. NR 111.21 when a WPDES permit containing requirements consistent with this subchapter is issued to the permittee.

(2) PERMIT APPLICATION. The department shall review materials submitted by the applicant under s. NR 111.41 at the time of the initial permit application and before each permit renewal or reissuance and shall take all of the following actions:

(a) After receiving the initial permit application from the permittee, the department shall determine the applicable standards specified in s. NR 111.21 to apply to the new facility. In addition, the department shall review materials to determine compliance with the applicable standards.

(b) For each subsequent permit renewal, the department shall review the application materials and monitoring data to determine whether requirements, or additional requirements, for design and construction technologies or operational measures shall be included in the permit.

(c) For track II facilities, the department may review the information collection proposal plan required under s. NR 111.41 (19) (b). The facility may initiate sampling and data collection prior to receiving comment from the department.

SUBCHAPTER IV
NEW UNITS AT EXISTING FACILITIES

NR 111.30 Requirement to comply with BTA standards.

(1) The owner or operator of a new unit at an existing facility that meets the applicability criteria specified in s. NR 111.02 shall, at a minimum, comply with all of the following requirements:

(a) Upon commencement of the new unit's operation, comply with the BTA standards for impingement mortality and entrainment under s. NR 111.31 for all cooling water intake flows used by the new unit. The remainder of the existing facility is subject to the impingement

mortality standard under s. NR 111.12 and the entrainment standard under s. NR 111.13. The entire existing facility, including any new units, is subject to any measures to protect threatened and endangered species and designated critical habitat established under s. NR 111.16.

(b) Submit and retain the information required under s. NR 111.40 (3) for the new unit to the department no later than 180 days before the planned commencement of cooling water withdrawals for the operation of the new unit. If the permittee has already submitted the required information in a previous permit application, the permittee may choose to submit an update to the required information.

(c) Conduct compliance monitoring as specified in s. NR 111.32.

(d) Report information and data and keep records as specified in s. NR 111.15.

(2) The requirements specified in sub. (1) shall be implemented through a WPDES permit for each facility subject to this subchapter. Permit requirements and conditions shall be based on the information submitted in the permit application, as determined by the department.

NR 111.31 BTA standards. (1) GENERALLY. Subject to sub. (3) and except as provided in sub. (4), the owner or operator of a new unit at an existing facility shall achieve the impingement mortality and entrainment standards provided in either sub. (2) (a) or (b) for each cooling water intake structure used to provide cooling water to the new unit.

(2) COMPLIANCE OPTIONS. The permittee shall, except as provided in sub. (4) and subject to sub. (3), comply with one of the following:

(a) *Option I.* The permittee shall reduce the design intake flow for the new unit, at a minimum, to a level commensurate with that which can be attained by the use of a closed-cycle recirculating system for the same level of cooling for the new unit.

(b) *Option II.* The permittee shall demonstrate to the department that the technologies and operational measures employed will reduce the level of adverse environmental impact from any cooling water intake structure used to supply cooling water to the new unit to a comparable level to that which would be achieved under par. (a). The demonstration shall include showing that the entrainment reduction is equivalent to 90 percent or greater of the reduction that could be achieved through compliance with par. (a). In addition, the demonstration shall include showing that the impacts to fish and shellfish, including important forage and predator species, within the watershed will be comparable to those that would result under the requirements specified in par.

(a).

(3) ALTERNATIVE REQUIREMENTS. The permittee shall comply with any alternative requirements established by the department. Alternative requirements may be established if the department determines that the individual requesting alternative requirements demonstrates all of the following:

(a) The data specific to the facility would result in compliance costs wholly out of proportion to the costs U.S. environmental protection agency considered in establishing the requirement at issue, or would result in significant adverse impacts on local air quality, significant adverse impacts on local water resources other than impingement or entrainment, or significant adverse impacts on local energy markets.

(b) The alternative requirements achieve a level of performance as close as practicable to the requirements under sub. (2) (a).

(c) The alternative requirements ensure compliance with these regulations, other applicable provisions of the federal clean water act, and any applicable requirement of state or tribal law.

(4) EXCLUDED COOLING WATER FLOW AND ADDITIONAL BTA STANDARDS

(a) *Excluded cooling water flows*. This section does not apply to any of the following:

1. Process water, graywater, wastewater, reclaimed water, or other waters reused as cooling water in lieu of water obtained by surface water intakes.

2. Cooling water used by manufacturing facilities for contact cooling purposes.

3. Portions of water withdrawals for auxiliary plant cooling uses comprising less than 2 MGD of the facility's flow.

4. Any quantity of emergency back-up water flows.

(b) *Additional BTA standards*. For cooling water flows excluded under par. (a), the department may establish additional BTA standards for impingement mortality and entrainment on a site-specific basis.

NR 111.32 Monitoring requirements. The permittee shall complete all of the following monitoring to demonstrate compliance with the requirements specified in s. NR 111.31:

(1) The permittee shall comply with any monitoring requirements established by the department for impingement, impingement mortality, and entrainment of the commercial,

recreational, and forage base fish and shellfish species identified in the source water baseline biological characterization data required under s. NR 111.41 (3). Monitoring methods used shall be consistent with those used for the source water baseline biological characterization. If the department establishes such monitoring requirements, the frequency of monitoring and specific protocols shall be determined by the department.

(2) The permittee shall conduct flow and velocity monitoring daily that is representative of the normal operating conditions of the date on which each sample is taken. Flow monitoring shall include measuring cooling water withdrawals, make-up water, and blowdown volume and shall be reported as a daily total volume. Velocity shall be reported as a daily maximum velocity. The department may require additional monitoring necessary to demonstrate compliance with s. NR 111.31.

(3) A permittee complying with the option II requirements under s. NR 111.31 (2) shall monitor to demonstrate achievement of reductions commensurate with a closed-cycle recirculating system. The permittee shall monitor entrainable organisms outside the zone of influence of the intake structure. The permittee shall also monitor the latent entrainment mortality in front of the intake structure. Mortality after passing the cooling water intake structure shall be counted as 100 percent mortality unless the permittee has demonstrated to the approval of the department that the mortality for each species is less than 100 percent. Monitoring shall be representative of the cooling water intake when the structure is in operation. In addition, sufficient samples shall be collected to allow for calculation of annual average entrainment levels of all life stages of fish and shellfish. Specific monitoring protocols and frequency of monitoring shall be determined by the department. The permittee shall follow the monitoring frequencies identified by the department for at least 2 years after the initial permit issuance. After that time, the department may approve a request for less frequent monitoring in the remaining years of the permit term and when a subsequent permit is reissued. The monitoring shall measure the total count of entrainable organisms or density of organisms, unless the department approves of a different metric for such measurements. In addition, the permittee shall monitor the AIF for each intake. The AIF shall be measured at the same time as collection of the samples of entrainable organisms. The department may require additional monitoring necessary to demonstrate compliance with s. NR 111.31.

(4) The permittee shall comply with any additional monitoring for impingement or entrainment at the cooling water intake structure used by a new unit, including any of the following:

(a) The department may require additional monitoring if there are changes in operating conditions at the facility or in the source waterbody that warrant a re-examination of the operational conditions specified in s. NR 111.41 (7).

(b) The department may require additional monitoring for species not subject to the BTA requirements for impingement mortality under s. NR 111.12. Such monitoring requirements shall be determined by the department on a site-specific basis.

SUBCHAPTER V

APPLICATION PROCEDURES

NR 111.40 Application requirements.

(1) NEW FACILITIES WITH NEW OR MODIFIED COOLING WATER INTAKE STRUCTURES. New facilities with cooling water intake structures shall submit all of the following information to the department for review:

(a) The information required under s. NR 111.41 (1), (2), (3) (a) to (h), and (17).

(b) A statement that the facility intends to comply with one of the following:

1. The track I requirements for new facilities specified in s. NR 111.21 (2) (a).

2. The track II requirements for new facilities specified in s. NR 111.21 (2) (b).

(c) Facilities choosing to comply with the track I requirements specified in s. NR 111.21 (2) (a) shall also submit the information required under s. NR 111.41 (15), (16), and (18).

(d) Facilities choosing to comply with the track II requirements specified in s. NR 111.21 (2) (b) shall also submit the information required under NR 111.41 (19).

(2) EXISTING FACILITIES WITH COOLING WATER INTAKE STRUCTURES.

(a) *Existing facilities that withdraw less than or equal to 2 MGD DIF or use less than 25 percent exclusively for cooling.* The owner or operator of an existing facility designed to withdraw less than or equal to 2 MGD DIF or that uses less than 25 percent of the total water withdrawn exclusively for cooling purposes shall submit to the department any information requested by the department that is needed to inform a BTA determination.

(b) *Existing facilities that withdraw greater than 2 MGD DIF and less than or equal to 125 MGD AIF*. The owner or operator of an existing facility that withdraws greater than 2 MGD DIF and less than or equal to 125 MGD AIF and that uses 25 percent or more of the total water withdrawn exclusively for cooling purposes shall submit to the department for review the information required under s. NR 111.41 (1), (2), and (13) and applicable provisions of s. NR 111.41 (3) to (7).

(c) *Existing facilities that withdraw greater than 125 MGD AIF*. In addition to requirements specified in par. (b) the owner or operator of an existing facility that withdraws greater than 125 MGD AIF and that uses 25 percent or more of the total water withdrawn exclusively for cooling purposes, as defined in s. NR 111.03 (1), shall submit to the department for review the information required under s. NR 111.41 (8) to (12).

(d) *Reduced information.* If the owner or operator of an existing facility intends to comply with the BTA standards for entrainment using a closed-cycle recirculating system as defined in s. NR 111.03 (5), the department may reduce or waive some or all of the information required under s. NR 111.41 (8) to (12).

(e) *Communication with U.S. fish and wildlife service*. In addition to requirements specified in pars. (a) to (d), the applicant shall also submit with its permit application all information received as a result of any communication with a field office of the U.S. fish and wildlife service.

(f) *Additional information.* The owner or operator of an existing facility shall submit any additional information that the department determines is necessary under s. NR 111.42 (2).

(3) NEW UNITS AT EXISTING FACILITIES.

(a) *New units at existing facilities.* The owner or operator of a new unit at an existing facility shall submit or update any information previously provided to the department by submitting the information required under s. NR 111.41 (1), (2), (4), (7), and (14) and applicable provisions of s. NR 111.41 (3), (5), and (6). Requests for and approvals of alternative requirements sought under s. NR 111.31 (2) (b) or (3) shall be submitted with the permit application.

(b) *New units at existing facilities not previously subject to subchapter IV*. The owner or operator of a new unit at an existing facility not previously subject to this chapter that increases the total capacity of the existing facility to more than 2 MGD DIF and that uses 25 percent or

more of the total water withdrawn exclusively for cooling purposes shall submit the information required under s. NR 111.41 (1), (2), (4), and (7) and applicable provisions of s. NR 111.41 (3), (5), and (6) at the time of the permit application for the new unit. Requests for alternative requirements under s. NR 111.31 (2) (b) or (3) shall be submitted with the permit application. If the total capacity of the facility will increase to more than 125 MGD AIF, the owner or operator shall also submit the information required under s. NR 111.41 (8) to (12).

(c) *All new units at existing facilities*. The owner or operator of a new unit at an existing facility shall also submit with its permit application all information received as a result of any communication with a field office of the U.S. fish and wildlife service.

(d) *Reduced information.* If the owner or operator of a new unit at an existing facility intends to comply with the BTA standards for entrainment using a closed-cycle recirculating system as defined in s. NR 111.03 (5), the department may reduce or waive some or all of the information required under s. NR 111.41 (8) to (12).

(4) RETIREMENTS.

(a) *Within the current permit term*. If the owner or operator of an existing facility plans to retire the facility before the current permit expires, then the requirements of subs. (2) and (3) do not apply.

(b) *Within the subsequent permit term*. If the owner or operator of an existing facility plans to retire the facility after the current permit expires but within one permit cycle, then the department may waive the requirements of s. NR 111.41 (6) to (13) upon receiving a signed certification statement from the owner or operator of the facility specifying the last operating date of the facility.

NR 111.41 Application materials.

(1) SOURCE WATER PHYSICAL DATA. As part of the source water physical data, the applicant shall submit information including all of the following:

(a) A narrative description and scaled drawings showing the physical configuration of all source waterbodies used by the facility, including areal dimensions, depths, salinity and temperature regimes, and other documentation that supports the facility's determination of the waterbody type where each cooling water intake structure is located.

(b) Identification and characterization of the source waterbody's hydrological and geomorphological features, as well as the methods used to conduct any physical studies to determine the intake's area of influence within the waterbody and the results of such studies.

(c) Locational maps.

(2) COOLING WATER INTAKE STRUCTURE DATA. As part of the cooling water intake structure data, the information submitted shall include all of the following:

(a) A narrative description of the configuration of each cooling water intake structure and where it is located in the waterbody and in the water column.

(b) Latitude and longitude in degrees, minutes, and seconds for each cooling water intake structure.

(c) A narrative description of the operation of each cooling water intake structure, including design intake flows, daily hours of operation, number of days of the year in operation and seasonal changes, if applicable.

(d) A flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges.

(e) Engineering drawings of each cooling water intake structure.

(3) SOURCE WATER BASELINE BIOLOGICAL CHARACTERIZATION DATA. Source water baseline biological characterization information is required to characterize the biological community in the vicinity of the cooling water intake structure and to characterize the operation of the cooling water intake structure. The department may also use this information in subsequent permit renewal proceedings to determine if the facility's design and construction technology plan as required under sub. (18) should be revised. This supporting information shall include existing data if they are available. However, the owner or operator of the facility may supplement the data using newly conducted field studies if desired. The owner or operator shall comply with all of the following:

(a) The owner or operator shall submit all of the following data or, if any of the data are not available, a description of efforts made to identify sources of that data:

1. A list of species or relevant taxa for all life stages and their relative abundance in the vicinity of the cooling water intake structure.

2. Identification of the species and life stages that would be most susceptible to impingement and entrainment. Species evaluated shall include the forage base as well as those most important in terms of significance to commercial and recreational fisheries.

3. Identification and evaluation of the primary period of reproduction, larval recruitment, and period of peak abundance for relevant taxa.

4. Data representative of the seasonal and daily activities, such as feeding and water column migration, of biological organisms in the vicinity of the cooling water intake structure.

5. Identification of all threatened, endangered, and other protected species and critical habitat that are or may be present in the vicinity of the cooling water intake structure, based on readily available information at the time of permit application. In addition, in developing its permit application, the owner or operator of an existing facility or new unit at an existing facility shall, based on readily available information at the time of the permit application, identify all federally listed threatened and endangered species or designated critical habitat that are or may be present in the action area. For an existing facility for which the owner or operator has obtained incidental take exemption or authorization for its cooling water intake structure from the U.S. fish and wildlife service, any information submitted in order to obtain that exemption or authorization may be used to satisfy the permit application information requirement under this subdivision.

(b) If the applicant supplements the information requested in par. (a) with data collected using field studies, supporting documentation for the source water baseline biological characterization shall include a description of all methods and quality assurance procedures for sampling. It also shall include data analysis, including a description of the study area; taxonomic identification of sampled and evaluated biological assemblages, including all life stages of fish and shellfish; and sampling and data analysis methods. The sampling and data analysis methods used shall be appropriate for a quantitative survey and based on consideration of methods used in other biological studies performed within the same source waterbody. The study area shall include, at a minimum, the area of influence of the cooling water intake structure.

(c) The applicant shall submit all of the following additional information:

1. Documentation of any public participation or consultation with federal or state agencies undertaken in development of the plan.

2. A description of protective measures and stabilization activities that have been implemented, and a description of how these measures and activities affected the baseline water condition in the vicinity of the intake.

3. A list of fragile species at the facility. The applicant need only identify those species not already identified as fragile under s. NR 111.03 (18). New units at an existing facility are not required to resubmit this information if the cooling water withdrawals for the operation of the new unit are from an existing intake.

(4) COOLING WATER SYSTEM DATA. The owner or operator of an existing facility shall submit the following information for each cooling water intake structure used or intended to be used:

(a) A description of the operations of the cooling water system and intake structure that shall include all of the following:

1. A narrative description of the operation of the cooling water system and its relationship to cooling water intake structures.

2. The proportion of the design intake flow that is used in the system.

3. The number of days of the year the cooling water system is in operation and seasonal changes in the operation of the system, if applicable.

4. The proportion of DIF for contact cooling, non-contact cooling, and process uses.

5. A distribution of water reuse to include cooling water reused as process water, process water reused for cooling, and the use of graywater for cooling.

6. A description of reductions in total water withdrawals including cooling water intake flow reductions already achieved through minimized process water withdrawals.

7. A description of any cooling water that is used in a manufacturing process either before or after it is used for cooling, including other recycled process water flows.

8. The proportion of the source waterbody withdrawn on a monthly basis.

(b) Design and engineering calculations prepared by a qualified professional and supporting data to support the description required under par. (a).

(c) A description of existing impingement and entrainment technologies or operational measures and a summary of their performance, including reductions in impingement mortality and entrainment due to intake location and reductions in total water withdrawals and usage.

(5) CHOSEN METHODS OF COMPLIANCE WITH IMPINGEMENT MORTALITY STANDARD. The owner or operator of the facility shall identify the chosen compliance method under s. NR 111.12 for existing facilities or s. NR 111.31 for new units at existing facilities for the entire facility or for each cooling water intake structure at the facility. The applicant shall identify any intake structure for which a de minimis or low capacity utilization rate determination is requested under s. NR 111.12 (2) (b). Any owner or operator that chooses to comply with the modified traveling screens or system of technologies as the BTA for impingement mortality under s. NR 111.12 (2) (a) 5. or 6. shall also submit an impingement technology performance optimization study described as follows:

(a) If the applicant chooses to utilize modified traveling screens to comply with the BTA requirements for impingement mortality under s. NR 111.12 (1) (a) 5., the impingement technology performance optimization study shall include a minimum of 2 years of biological data collection measuring the reduction in impingement mortality achieved by the modified traveling screens and demonstrating that the operation has been optimized to minimize impingement mortality. A complete description of the modified traveling screens and associated equipment shall be included, including type of mesh, mesh slot size, pressure sprays, and fish return mechanisms. A description of any biological data collection and data collection approach used in measuring impingement mortality shall be included and shall include all of the following:

1. Collection of data no less frequently than monthly. The department may require more frequent data collection or require a period of data collection longer than 2 years.

2. Biological data collection representative of the impingement and impingement mortality at the intakes subject to this paragraph.

3. A taxonomic identification to the lowest taxon possible of all organisms collected.

4. The method in which naturally moribund organisms are identified and taken into account.

5. The method in which mortality due to holding times is taken into account.

6. If the facility entraps fish or shellfish, a count of entrapment as impingement mortality.

7. The percent impingement mortality reflecting optimized operation of the modified traveling screen and all supporting calculations.

(b) If the applicant chooses to utilize a system of technologies to comply with the BTA requirements for impingement mortality under s. NR 111.12 (1) (a) 6., the impingement technology performance optimization study shall include biological data measuring the reduction in impingement mortality achieved by operation of the system of technologies, operational measures, and best management practices, and demonstrating that operation of the system has been optimized to minimize impingement mortality. This system of technologies, operational measures, and best management practices may include flow reductions, seasonal operation, unit closure, credit for intake location, and behavioral deterrent systems. The applicant shall document how each system element contributes to the system's performance. The applicant shall include a minimum of 2 years of biological data measuring the reduction in impingement mortality achieved by the system. The applicant shall also include a description of any sampling or data collection approach used in measuring the rate of impingement, impingement mortality, or flow reductions. Additionally, the applicant shall include the following information, as applicable:

1. If the demonstration relies in part on a credit for reductions in the rate of impingement in the system, the applicant shall provide an estimate of those reductions to be used as credit towards reducing impingement mortality, and any relevant supporting documentation, including previously collected biological data, performance reviews, and previously conducted performance studies not already submitted to the department. The submission of studies more than 10 years old shall include an explanation of why the data are still relevant and representative of conditions at the facility and explain how the data should be interpreted using the definitions of entrapment and impingement specified in s. NR 111.03 (14) and (20). The estimated reductions in rate of impingement shall be based on a comparison of the system to a once-through cooling system with a traveling screen whose point of withdrawal from the surface water source is located at the shoreline of the source waterbody. For impoundments that are waters of the state in part or whole, the facility's rate of impingement shall be measured at a location within the cooling water intake system that the department deems appropriate. In addition, the applicant shall include 2 years of biological data collection demonstrating the rate of impingement resulting from the system. For this demonstration, the applicant shall collect data no less frequently than monthly, but the department may require more frequent data collection.

2. If the demonstration relies in part on a credit for reductions in impingement mortality already obtained at the facility, the applicant shall include a minimum of 2 years of biological data collection demonstrating the level of impingement mortality the system is capable of achieving. The applicant shall submit any relevant supporting documentation, including previously collected biological data, performance reviews, and previously conducted performance studies not already submitted to the department. The applicant shall provide a description of any sampling or data collection approach used in measuring impingement mortality. In addition, for this demonstration the applicant shall do all of the following:

a. Collect data no less frequently than monthly. The department may establish more frequent data collection or require a period of data collection longer than 2 years.

b. Conduct biological data collection that is representative of the impingement and the impingement mortality at an intake subject to this provision. In addition, the applicant shall describe how the location of the cooling water intake structure in the waterbody and the water column are accounted for in the points of data collection.

c. Include a taxonomic identification to the lowest taxon possible of all organisms to be collected.

d. Describe the method in which naturally moribund organisms are identified and taken into account.

e. Describe the method in which mortality due to holding times is taken into account.

f. If the facility entraps fish or shellfish, include a count of the entrapment as impingement mortality.

3. If the demonstration relies in part on flow reduction to reduce impingement, the applicant shall include 2 years of intake flows, measured daily, as part of the demonstration, and describe the extent to which flow reductions are seasonal or intermittent. The applicant shall document how the flow reduction results in reduced impingement. In addition, the applicant shall describe how the reduction in impingement has reduced impingement mortality.

4. The applicant shall document the percent impingement mortality reflecting optimized operation of the total system of technologies, operational measures, and best management practices and all supporting calculations. The total system performance is the combination of the impingement mortality performance reflected in subds. 1. to 3.

(6) ENTRAINMENT PERFORMANCE STUDIES. The owner or operator of an existing facility shall submit any previously conducted studies or studies obtained from other facilities addressing technology efficacy, through-facility entrainment survival, and other entrainment studies. Any such submittals shall include a description of each study, together with underlying data, and a summary of any conclusions or results. Any studies conducted at other locations shall include an explanation as to why the data are relevant and representative of conditions at the facility operated by the applicant and explain how the data should be interpreted using the definition of entrainment specified in s. NR 111.03 (12).

(7) OPERATIONAL STATUS. The owner or operator of an existing facility shall submit a description of the operational status of each generating, production, or process unit that uses cooling water, including all of the following:

(a) For power production or steam generation, all of the following:

1. Descriptions of individual unit operating status, including the age of each unit.

2. The capacity utilization rate or equivalent for the previous 5 years, including any extended or unusual outages that significantly affect current data for flow, impingement, entrainment, or other factors.

3. An identification of any operating unit with a capacity utilization rate of less than 8 percent averaged over a 24-month block contiguous period.

4. Any major upgrades completed within the last 15 years, including boiler replacement, condenser replacement, turbine replacement, or changes to fuel type.

(b) For nuclear facilities, descriptions of completed, approved, or scheduled uprates and nuclear regulatory commission relicensing status of each unit.

(c) For process units at a facility that uses cooling water other than for power production or steam generation, for which the owner or operator intends to use reductions in flow or changes in operations to meet the requirement under s. NR 111.12, all of the following:

1. Descriptions of individual production processes and product lines.

2. Operating status, including the age of each line.

3. Seasonal operation, including any extended or unusual outages that significantly affect current data for flow, impingement, entrainment, or other factors

4. Any major upgrades completed within the last 15 years, and plans or schedules for decommissioning or replacement of process units or production processes and product lines.

(d) For all manufacturing facilities, descriptions of current and future production schedules.

(e) Descriptions of plans or schedules for any new units planned within the next 5 years.

(8) ENTRAINMENT CHARACTERIZATION STUDY. The owner or operator of an existing facility that withdraws greater than 125 MGD AIF shall develop for submission to the department an entrainment characterization study that includes a minimum of 2 years of entrainment data collection. The entrainment characterization study shall include all of the following components:

(a) *Entrainment data collection method*. An identification and documentation of organisms collected to the lowest taxon possible of all life stages of fish and shellfish that are in the vicinity of the cooling water intake structure and are susceptible to entrainment, including any threatened or endangered species with habitat range that includes waters in the vicinity of the cooling water intake structure. The data collection period and frequency shall be no less than biweekly during the periods of primary reproduction and larval recruitment, and peak abundance, as identified by the department. Biological data collection shall be representative of the entrainment at the intakes subject to this provision. The owner or operator of the facility shall identify and document how the location of the cooling water intake structure in the waterbody and the water column are accounted for by the data collection locations. Unless department approval is given, the data collection location shall not be at the discharge.

(b) *Biological entrainment characterization*. Characterization of all life stages of fish, shellfish, and any species protected under federal, state, or tribal law, including threatened or endangered species, including a description of their abundance and their temporal and spatial characteristics in the vicinity of the cooling water intake structure, based on sufficient data to characterize annual, seasonal, and diel variations in entrainment, including variations related to climate and weather differences, spawning, feeding, and water column migration. This characterization may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Identification of all life stages of fish and shellfish shall include identification of any surrogate species used, and identification of data representing both motile and non-motile life-stages of organisms.

(c) *Analysis and supporting documentation*. Documentation of the current entrainment of all life stages of fish, shellfish, and any threatened or endangered species. The documentation

may include historical data that are representative of the current operation of the facility and of biological conditions at the site. Entrainment data to support the facility's calculations shall be collected during periods of representative operational flows for the cooling water intake structure, and the flows associated with the data collection shall be documented. The method used to determine latent mortality along with data for specific organism mortality or survival that is applied to other life-stages or species shall be identified. The owner or operator of the facility shall identify and document all assumptions and calculations used to determine the total entrainment for the facility, together with all methods and quality assurance or quality control procedures for data collection and data analysis. The proposed data collection and data analysis methods shall be appropriate for a quantitative survey.

(9) COMPREHENSIVE TECHNICAL FEASIBILITY AND COST EVALUATION STUDY. The owner or operator of an existing facility that withdraws greater than 125 MGD AIF shall develop for submission to the department an engineering study of the technical feasibility and incremental costs of candidate entrainment control technologies. In addition, the study shall include all of the following:

(a) *Technical feasibility*. An evaluation of the technical feasibility of closed-cycle recirculating systems, fine mesh screens with a mesh size of 2 millimeters or smaller, variable speed pumps, and water reuse or alternate sources of cooling water. In addition, this study shall include all of the following:

1. A description of all technologies and operational measures considered, including alternative designs of closed-cycle recirculating systems such as natural draft cooling towers, mechanical draft cooling towers, hybrid designs, and compact or multi-cell arrangements.

2. A discussion of land availability, including evaluations of all of the following:

a. Adjacent land and acres potentially available due to retirements of generating units, production units, and other buildings and equipment.

b. Potential for repurposing of areas devoted to ponds, coal piles, rail yards, transmission yards, and parking lots.

3. A discussion of available sources of process water, graywater, wastewater, reclaimed water, or other waters of appropriate quantity and quality for use as some or all of the cooling water needs of the facility.

4. Documentation of factors other than cost that may make a candidate technology impractical or infeasible for further evaluation.

(b) *Other entrainment control technologies*. An evaluation of additional technologies for reducing entrainment, if required by the department.

(c) *Cost evaluations*. Engineering cost estimates of all technologies considered under pars. (a) and (b). Facility costs shall also be adjusted to estimate social costs. All costs shall be presented as the net present value and the corresponding annual value. Costs shall be clearly labeled as compliance costs or social costs. Compliance costs are calculated after-tax while social costs are calculated pre-tax. Compliance costs include the facility's administrative costs, including costs of the permit application while the social cost adjustment includes the department's administrative costs. Any outages, downtime, or other impacts to facility net revenue are included in compliance costs while only that portion of lost net revenue that does not accrue to other producers can be included in social costs. Social costs shall also be discounted using social discount rates of 3 percent and 7 percent. Assumptions relating to depreciation schedules, tax rates, interest rates, and discount rates shall be identified. The applicant shall separately discuss facility level compliance costs and social costs and provide all of the following documentation:

1. Costs and explanation of any additional facility modifications necessary to support construction and operation of technologies considered under pars. (a) and (b), including relocation of existing buildings or equipment, reinforcement or upgrading of existing equipment, and additional construction and operating permits. Assumptions related to depreciation schedules, interest rates, and useful life of the technology considered shall be identified.

2. Costs and explanation for addressing any non-water quality environmental and other impacts identified in sub. (11). The cost evaluation shall include a discussion of all reasonable attempts to mitigate each of these impacts.

(10) BENEFITS VALUATION STUDY. The owner or operator of an existing facility that withdraws greater than 125 MGD AIF shall develop for submission to the department an evaluation of the benefits of the candidate entrainment reduction technologies and operational measures evaluated in sub. (9), including using the entrainment characterization study completed in sub. (8). Each category of benefits shall be described narratively, and when possible, benefits

shall be quantified in physical or biological units and monetized using appropriate economic valuation methods. The benefits valuation study shall include all of the following elements:

(a) Incremental changes in the numbers of individual fish and shellfish lost due to impingement mortality and entrainment for all life stages of each exposed species.

(b) A description of the basis for any estimates of changes in the stock sizes or harvest levels of commercial and recreational fish or shellfish species or forage species.

(c) A description of the basis for any monetized values assigned to changes in the stock size or harvest levels of commercial and recreational fish or shellfish species, forage fish, and to any other ecosystem or nonuse benefits.

(d) A discussion of mitigation efforts completed prior to October 14, 2014, including how long they have been in effect and how effective they have been.

(e) A discussion, with quantification and monetization, where possible, of any other benefits expected to accrue to the environment and local communities, including improvements for mammals, birds, and other organisms and aquatic habitats.

(f) A discussion, with quantification and monetization, where possible, of any benefits expected to result from any reductions in thermal discharges from entrainment technologies.

(11) NON-WATER QUALITY ENVIRONMENTAL AND OTHER IMPACTS STUDY. The owner or operator of an existing facility that withdraws greater than 125 MGD AIF shall develop for submission to the department a detailed facility-specific discussion of the changes in non-water quality environmental and other impacts attributed to each technology and operational measure considered under sub. (9), including both impacts increased and impacts decreased. The study shall include all of the following:

(a) Estimates of changes to energy consumption, including auxiliary power consumption and turbine backpressure energy penalty.

(b) Estimates of air pollutant emissions and of the human health and environmental impacts associated with the emissions.

(c) Estimates of changes in noise.

(d) A discussion of impacts to safety, including documentation of the potential for plumes, icing, and availability of emergency cooling water.

(e) A discussion of facility reliability, including facility availability, production of steam, impacts to production based on process unit heating or cooling, and reliability due to cooling water availability.

(f) Estimates of expected significant changes in consumption of water, including a facility-specific comparison of the evaporative losses of both once-through cooling and closed-cycle recirculating systems, and documentation of impacts attributable to changes in water consumption.

(g) A discussion of all reasonable attempts to mitigate each of the factors specified in pars. (a) to (f).

(12) PEER REVIEW. If the applicant is required to submit studies under subs. (9) to (11), the applicant shall conduct an external peer review of each report to be submitted with the permit application. The applicant shall select peer reviewers and notify the department in advance of the peer review. The department may disapprove of a peer reviewer or require additional peer reviewers. The department may confer with the U.S. environmental protection agency; federal, state, and tribal fish and wildlife management agencies with responsibility for fish and wildlife potentially affected by the cooling water intake structure; independent system operators; and state public utility regulatory agencies to determine which peer review comments shall be addressed. The applicant shall provide an explanation for any significant reviewer comments not accepted. Peer reviewers shall have appropriate qualifications and their names and credentials shall be included in the peer review report.

(13) ALTERNATIVES ANALYSIS FOR CANDIDATE ENTRAINMENT BTA. An owner or operator operating a facility that withdraws greater than 2 MGD DIF and less than or equal to 125 MGD AIF shall submit information on analysis of available entrainment reduction technologies and strategies if the applicant has such information at the time of permit application. Information on analysis of available entrainment reduction technologies and strategies includes an evaluation of closed-cycle recirculating systems, fine mesh screens with a mesh size of 2 millimeters or smaller, variable speed pumps, water reuse or alternate sources of cooling water, and any additional technologies identified by the applicant. The submittal shall include the following, as appropriate:

(a) All of the following if the applicant has the information at the time of permit application:

1. Numbers and types of organisms entrained, including the numbers and species, or lowest taxonomic classification possible, of threatened and endangered species and designated critical habitat, such as prey base.

2. Impact of changes in particulate emissions or other pollutants associated with entrainment technologies.

3. Land availability as it relates to the feasibility of entrainment technology.

4. Remaining useful plant life.

5. Quantified and qualitative social benefits and costs of available entrainment technologies, when such information on both benefits and costs is of sufficient rigor to make a decision.

(b) Any of the following information that the applicant has at the time of the permit application:

1. Entrainment impacts on the waterbody.

2. Thermal discharge impacts.

3. Credit for reductions in flow associated with the retirement of units occurring within 10 years preceding October 14, 2014.

4. Impacts on the reliability of energy delivery within the immediate area.

5. Impacts on water consumption.

6. Availability of process water, graywater, wastewater, reclaimed water, or other waters of appropriate quantity and quality for reuse as cooling water.

(14) NEW UNITS AT EXISTING FACILITIES. The applicant shall identify the chosen compliance method for the new unit. In addition, the owner or operator that selects the BTA standards for new units under s. NR 111.31 (2) (b) as its route to compliance shall submit information to demonstrate entrainment reductions equivalent to 90 percent or greater of the reduction that could be achieved through compliance with s. NR 111.31 (2) (a). The demonstration shall include the entrainment characterization study specified in sub. (8). In addition, if data specific to the facility indicates that compliance with the BTA requirements for each new unit would result in compliance costs wholly out of proportion to the costs the U.S. environmental protection agency considered in establishing the requirements at issue or would result in significant adverse impacts on local air quality, significant adverse impacts on local water resources other than impingement and entrainment, or significant adverse impacts on local

energy markets, the applicant shall submit all supporting data as part of this subsection. The department may require that additional data and information, including monitoring, be included as part of this subsection.

(15) FLOW REDUCTION INFORMATION. If the owner or operator is required to comply with the flow reduction requirements specified in s. NR 111.21 (2) (a) 1., the applicant shall submit all of the following information to the department to demonstrate that flow has been reduced to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system:

(a) A narrative description of the system that has been designed to reduce intake flow and any engineering calculations, including documentation that make-up and blowdown flows have been minimized.

(b) If the flow reduction requirement is met entirely, or in part, by reusing or recycling water withdrawn for cooling purposes in subsequent industrial processes, documentation that the amount of cooling water that is not reused or recycled has been minimized.

(16) VELOCITY INFORMATION. The applicant shall submit all of the following information to the department to demonstrate compliance with the requirement to meet a maximum design intake velocity of no more than 0.5 feet per second at each cooling water intake structure as specified in s. NR 111.21 (2) (a) 2.:

(a) A narrative description of the design, structure, equipment, and operation used to meet the velocity requirement.

(b) Design calculations showing that the velocity requirement will be met at minimum ambient source water surface elevations based on the 7−day Q10 flow or best professional judgment using available hydrological data, and maximum head loss across the screens or other device.

(17) SOURCE WATERBODY FLOW INFORMATION. The applicant shall submit to the department all of the following information to demonstrate that the cooling water intake structure meets the flow requirements specified in s. NR 111.21 (2) (a) 3. or (2) (b) 2.:

(a) If the cooling water intake structure is located in a river or stream, the annual mean flow and any supporting documentation and engineering calculations to show that the cooling water intake structure meets the flow requirements.

(b) If the cooling water intake structure is located in a lake or reservoir, a narrative description of the waterbody thermal stratification and any supporting documentation and engineering calculations to show that the natural thermal stratification and turnover pattern will not be disrupted by the total design intake flow. In cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish, the applicant shall provide supporting documentation and include a written concurrence from any fisheries management agencies with responsibility for fisheries potentially affected by the cooling water intake structure.

(18) DESIGN AND CONSTRUCTION TECHNOLOGY PLAN. To comply with s. NR 111.21 (2) (a) 4. and 5., the applicant shall submit to the department a design and construction technology plan, which shall include all of the following:

(a) Delineation of the hydraulic zone of influence for the cooling water intake structure.

(b) A statement declaring whether each of following statements are true or false and any evidence necessary to support each claim:

1. Threatened, endangered, or otherwise protected federal, state or tribal species or critical habitat for these species is present within the hydraulic zone of influence of the owner or operator's cooling water intake structure.

2. Migratory, sport, or commercial species of impingement concern pass through the hydraulic zone of influence of the owner or operator's cooling water intake structure.

3. The department, U.S. environmental protection agency, or U.S. fish and wildlife service has determined that the proposed facility, after meeting the technology-based performance requirements specified in s. NR 111.21 (2) (a) 1. to 3., will still contribute unacceptable stress to the protected species, critical habitat of those species, or species of concern.

4. There are, or will be upon commencement of operation, undesirable cumulative stressors affecting entrainable life stages of species of concern to the department.

(c) A plan that explains the technologies and measures selected if the owner or operator of a new facility is required to install design and construction technologies or operational measures. The plan shall be based on information collected for the source water baseline biological characterization required under sub. (3). The plan shall include all of the following information:

1. A narrative description of the design and operation of the design and construction technologies, including fish-handling and return systems, that the owner or operator will use to maximize the survival of the species expected to be most susceptible to impingement. Provide species-specific information that demonstrates the efficacy of the technology.

2. A narrative description of the design and operation of the design and construction technologies that the owner or operator will use to minimize entrainment of the species expected to be the most susceptible to entrainment, which shall include species-specific information that demonstrates the efficacy of the technology.

3. Design calculations, drawings, and estimates to support the descriptions provided in subds 1. and 2.

Note: Examples of appropriate technologies include wedgewire screens, fine mesh screens, fish handling and return systems, barrier nets, and aquatic filter barrier systems. Examples of appropriate operational measures include seasonal shutdowns, reductions in flow, and continuous operations of screens.

(19) TRACK II COMPREHENSIVE DEMONSTRATION STUDY. The applicant shall perform and submit the results of a comprehensive demonstration study. This information is required to characterize the source water baseline in the vicinity of the cooling water intake structure, characterize operation of the cooling water intake, and to confirm that the technology proposed or implemented at the cooling water intake structure reduces the impacts to fish and shellfish to levels comparable to those the owner or operator would achieve through implementation of the requirements specified in s. NR 111.21 (2) (a) 1. and 2. of track I. To meet this requirement, the applicant shall do all of the following:

(a) Demonstrate reduction of both impingement mortality and entrainment of all life stages of fish and shellfish to 90 percent or greater of the reduction that would be achieved through s. NR 111.21 (2) (a) 1. and 2.

(b) Develop and submit to the department a plan containing a proposal for how information will be collected to support the study. The plan shall include all of the following:

1. A description of the proposed or implemented technologies to be evaluated in the study.

2. A list and description of any historical studies characterizing the physical and biological conditions in the vicinity of the proposed or actual intakes and their relevancy to the

proposed study. If the owner or operator proposes to rely on existing source waterbody data, the data shall be no more than 5 years old, the applicant shall demonstrate that the existing data are sufficient to develop a scientifically valid estimate of potential impingement and entrainment impacts, and the applicant shall provide documentation showing that the data were collected using appropriate quality assurance or quality control procedures.

3. Documentation of any public participation or consultation with federal or state agencies undertaken in developing the plan.

4. A sampling plan for data that will be collected using actual field studies in the source waterbody, including all of the following:

a. A description of all methods and quality assurance procedures that will be used for sampling and data analysis. The sampling and data analysis methods proposed shall be appropriate for a quantitative survey and based on consideration of methods used in other studies performed in the source waterbody.

b. A description of the study area, including the hydraulic zone of influence of the cooling water intake structure and at least 100 meters beyond.

c. Taxonomic identification of the sampled or evaluated biological assemblages, including all life stages of fish and shellfish.

(c) Submit documentation of the results of the study to the department. Documentation of the results of the study shall include all of the following:

1. A source water biological study. The source water biological study shall include all of the following:

a. A taxonomic identification and characterization of aquatic biological resources, including a summary of historical and contemporary aquatic biological resources; determination and description of the target populations of concern; the species of fish and shellfish and all life stages that are most susceptible to impingement and entrainment; and a description of the abundance and a temporal and spatial characterization of the target populations based on the collection of multiple years of data to capture the seasonal and daily activities, such as spawning, feeding, and water column migration, of all life stages of fish and shellfish found in the vicinity of the cooling water intake structure.

b. An identification of all threatened or endangered species that may be susceptible to impingement and entrainment by the cooling water intake structure.

c. A description of additional chemical, water quality, and other anthropogenic stresses on the source waterbody.

2. An evaluation of potential cooling water intake structure effects. This evaluation shall include all of the following:

a. Calculations of the reduction in impingement mortality and entrainment of all life stages of fish and shellfish that would need to be achieved by the selected technologies to meet requirements under track II. To do this, the applicant shall determine the reduction in impingement mortality and entrainment that would be achieved by implementing the requirements specified in s. NR 111.21 (2) (a) 1. and 2. of track I.

b. An engineering estimate of efficacy for the proposed or implemented technologies used to minimize impingement mortality and entrainment of all life stages of fish and shellfish and maximize survival of impinged life stages of fish and shellfish. The applicant shall demonstrate that the technologies reduce impingement mortality and entrainment of all life stages of fish and shellfish to a level comparable to that which the owner or operator would achieve through implementation of the requirements specified in s. NR 111.21 (2) (a) 1. and 2. of track I. The efficacy projection shall include a site-specific evaluation of technology suitability for reducing impingement mortality and entrainment based on the results of the source water biological study specified in subd. 1. Efficacy estimates may be determined based on case studies that have been conducted in the vicinity of the cooling water intake structure, or site-specific technology prototype studies.

3. A verification monitoring plan. The applicant shall include in the study a plan to conduct, at a minimum, 2 years of monitoring to verify the full-scale performance of the proposed or implemented technologies and operational measures. The verification study shall begin at the start of operations of the cooling water intake structure and continue for a sufficient period of time to demonstrate that the facility is reducing the level of impingement and entrainment to the level documented in subd. 2. The plan shall describe the frequency of monitoring and the parameters to be monitored. The department will use the verification monitoring to confirm that the owner or operator is meeting the level of impingement mortality and entrainment reduction required in s. NR 111.21 (2) (b) and that the operation of the technology has been optimized.

NR 111.42 General application process provisions.

(1) SUBSEQUENT APPLICATIONS.

(a) *Reduced information*. 1. A permittee may request to reduce the information required to be submitted under s. NR 111.40 if the criteria in subd. 2. a. or b. are satisfied. In order to request a waiver of required application materials, the permittee shall submit a request to the department at least 2 years and 6 months prior to the expiration of its WPDES permit. The permittee's request shall identify each application material that it determines has not substantially changed since the previous permit application and the basis for the determination. The department has the discretion to accept or reject any part of the request.

2. A permittee may make a request under subd. 1. if any of the following applies:

a. Conditions at the facility and in the waterbody remain substantially unchanged since the previous application, and the relevant previously submitted information remains representative of current source water, intake structure, cooling water system, and operating conditions. A request for a waiver under such conditions may only be granted after the initial submission of the application materials required under s. NR 111.41.

b. The intake is located in a manmade lake or reservoir and the fisheries are stocked and managed by a state or federal natural resources agency or the equivalent. If the manmade lake or reservoir contains threatened or endangered species or is designated critical habitat, the request for the request may not be granted.

(b) *Newly listed species and newly designated critical habitat*. Any habitat designated as critical or species listed as threatened or endangered after issuance of the current permit whose range of habitat or designated critical habitat includes waters where a facility intake is located constitutes potential for a substantial change that shall be addressed by the permittee in subsequent permit applications, unless the facility received an exemption under 16 USC 1536 (o) or a permit under 16 USC 1539 (a) or there is no reasonable expectation of take.

(2) ADDITIONAL INFORMATION. The department has the discretion to request additional information to supplement the permit application, including making a request to inspect the facility, including any additional information from the facility recommended by the U.S. fish and wildlife service upon their review of the permit application under s. NR 111.16 (3).

(3) PERMIT APPLICATION RECORDS. To document compliance with the requirements under this section, the permittee shall keep records of all submissions that are part of its permit

application until the subsequent permit is issued. If the department approves a request for reduced permit application studies under sub. (1) (a) or s. NR 111.11 (2) (c) 2., the permittee shall keep records of all submissions that are part of the previous permit application until the subsequent permit is issued.

(4) CERTIFICATION. The permittee shall certify that its permit application is true, accurate, and complete.

(5) APPLICATION REVIEW. The department shall review the materials submitted by the applicant under s. NR 111.41 for completeness at the time of initial permit application and any application for a subsequent permit. The department may also consider previously submitted data and performance reviews in its review.

SECTION 2. EFFECTIVE DATE. This rule takes effect on the first day of the month following publication in the Wisconsin Administrative Register as provided in s. 227.22 (2) (intro.), Stats.

SECTION 3. BOARD ADOPTION. This rule was approved and adopted by the State of Wisconsin Natural Resources Board on [DATE].

Dated at Madison, Wisconsin _____.

STATE OF WISCONSIN

DEPARTMENT OF NATURAL RESOURCES

BY _____

Preston D. Cole, Secretary

(SEAL)