STATE OF WISCONSIN
DEPARTMENT OF ADMINISTRATION
DOA-2049 (R09/2016)

DIVISION OF EXECUTIVE BUDGET AND FINANCE
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ADMINISTRATIVE RULES
Fiscal Estimate & Economic Impact Analysis

1. Type of Estimate and Analysis	2. Date
☐ Original ☒ Updated ☐ Corrected	January 21, 2022

3. Administrative Rule Chapter, Title and Number (and Clearinghouse Number if applicable)
NR 102 –Water Quality Standards for Wisconsin Surface Waters
NR 105 – Surface Water Quality Criteria and Secondary Values for Toxic Substances
NR 106 - Procedures For Calculating Water Quality Based Effluent Limitations For Point Source Discharges To Surface Waters
NR 219 - Analytical Test Methods And Procedures
(CR 21-083)

4. Subject
Proposed surface water quality standard for two types of poly- and perfluoroalkyl substances (PFAS), perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) to protect public health as well as revisions to the procedures in the Wisconsin Pollutant Discharge Elimination System (WPDES) permitting program to implement the new water quality standard and proposed protocols for analyzing PFAS in sample results. Board Order WY-23-19

5. Fund Sources Affected	6. Chapter 20, Stats. Appropriations Affected
☐ GPR ☐ FED ☐ PRO ☐ PRS ☐ SEG ☐ SEG-S	None

7. Fiscal Effect of Implementing the Rule

☐ No Fiscal Effect	☐ Increase Existing Revenues	☐ Increase Costs	☐ Decrease Costs
☐ Indeterminate	☐ Decrease Existing Revenues	☒ Could Absorb Within Agency's Budget	

8. The Rule Will Impact the Following (Check All That Apply)

☐ State's Economy	☒ Specific Businesses/Sectors
☒ Local Government Units	☒ Public Utility Rate Payers
	☒ Small Businesses **(if checked, complete Attachment A)**

9. Estimate of Implementation and Compliance to Businesses, Local Governmental Units and Individuals, per s. 227.137(3)(b)(1).
$4,780,613 maximum in any year, $9,268,046 maximum over any two-year period. See Attachment B for a detailed derivation of these figures.

10. Would Implementation and Compliance Costs Businesses, Local Governmental Units and Individuals Be $10 Million or more Over Any 2-year Period, per s. 227.137(3)(b)(2)?
☐ Yes ☒ No

11. Policy Problem Addressed by the Rule
Poly- and perfluoroalkyl substances (PFAS) are human-made, organic compounds that have been manufactured for use in non-stick coatings, waterproof fabrics, firefighting foams, food packaging, and many other applications since the 1940s. PFAS are highly resistant to degradation and have been detected globally in water, sediment, and wildlife. This global distribution is of concern as PFAS have documented toxicity to animals and because epidemiological studies have suggested probable links to several human health effects. In Wisconsin, PFAS have been detected in drinking and surface water near sources of industrial use or manufacture and near spill locations. Perfluorooctane sulfonate (PFOS) has been found in fish tissue resulting in the issuance of special fish consumption advisories for some surface waters in the state.

The proposed rules include a water quality standard for two types of PFAS: PFOS and perfluorooctanoic acid (PFOA). Under the Clean Water Act, surface water quality standards can include criteria that are numeric or narrative. Wisconsin's existing Administrative Codes contain both numeric and narrative criteria for toxic substances:

- Chapter NR 105, Wis. Adm. Code, contains specific numeric criteria for numerous toxic pollutants as well as formulas for calculating numeric criteria and secondary values for toxics that do not yet have promulgated criteria.

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- Section NR 102.04(d), Wis. Adm. Code, contains Wisconsin's narrative criteria for toxics. This existing rule states that substances in concentrations or combinations which are toxic or harmful to humans *shall not be present in amounts found to be of public health significance* [emphasis added], nor shall substances be present in amounts which are acutely harmful to animal, plant or aquatic life.

The proposed PFOS and PFOA standard is both narrative and numeric in that it interprets Wisconsin's existing narrative standards under ss. NR 105.04(4m) and 102.04, Wis. Adm. Code, and it includes both narrative provisions and numeric criteria. The proposed rule defines levels of public health significance for the two types of PFAS based on preventing adverse effects from contact with or ingestion of surface waters of the state, or from ingestion of fish taken from waters of the state.

- For PFOS, the proposed level of public health significance is 8 ng/L for all waters except those that cannot naturally support fish and do not have downstream waters that support fish.
- For PFOA, the proposed levels of public health significance are 20 ng/L in waters classified as public water supplies under ch. NR 104, and 95 ng/L for other surface waters.

Related to the proposed PFOS and PFOA standards, the proposed rule also includes assessment protocols that clarify when a surface water that contains levels of PFOS or PFOA above the criteria in the narrative standard should be listed on the state's impaired waters list.

Additionally, this rule includes revisions to ch. NR 106, Wis. Adm. Code, that address WPDES permit implementation procedures for the new PFOS and PFOA standard. With regard to permit implementation of the PFOS and PFOA criteria, DNR is proposing source reduction as a first step toward reducing levels of PFOS and PFOA in the effluent rather than requiring treatment up front because source reduction is the most cost effective approach to reducing or eliminating PFOS and PFOA in wastewater discharges and it avoids the generation of contaminated carbon filters from treatment systems which will contain higher levels of PFOA and PFOS that will have to be disposed of in a safe manner.

The proposed rule establishes WPDES permit requirements for PFOS and PFOA discharges to surface waters of the state, in ch. NR 106 – Subchapter VIII, Wis Adm. Code, including: the determination of the need for a PFOS and PFOA Minimization Plan based on data generation in a reissued permit, a general schedule for PFOS and PFOA Minimization Plan permit implementation procedures, and PFOS and PFOA Minimization Plan requirements. The proposed permit requirements include standard PFOS and PFOA sampling frequencies for categories of permitted dischargers. If the department does not believe that PFOS or PFOA is present in a permittee's discharged effluent, sampling may be waived. Based on the effluent data collected, the proposed rule establishes procedures for determining whether a permitted facility's discharge contains PFOS or PFOA at levels that have the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standard. For permitted facilities that have the reasonable potential to exceed the PFOS or PFOA standard, the proposed rule requires that the permittee develop and implement a PFOS and PFOA Minimization Plan in accordance with the timelines in the rule and WPDES permit schedule. The permittee must also continue sampling for PFOS and PFOA.

The department expects that for nearly all WPDES permitted facilities with discharges to surface waters as well as industrial facilities that discharge wastewater to publicly owned treatment plants, source reduction actions outlined in minimization plans will reduce PFOS and PFOA discharges to levels that are below the public health based standard. The rule allows for up to 85 months of PFOS and PFOA minimization plan implementation. At permit reissuance, for a maximum period of up to 85 months after the initial reasonable potential determination, the department will evaluate the effluent quality of the permitted facility and conduct another determination as to whether levels of PFOS or PFOA in the effluent still have the reasonable potential to cause or contribute to an exceedance of the standard. The proposed rule provides:

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- If levels of PFOS or PFOA in the effluent have been eliminated or reduced to a concentration where there is no longer reasonable potential to exceed the standard, then the department may remove future scheduled actions, the permittee will be required to maintain effluent quality at levels that would not have the reasonable potential to cause or contribute to the exceedance of PFOS or PFOA standards, and continued monitoring may be required in the permit.
- If there is still reasonable potential to exceed the standard the department may request updates be made to the PFOA and PFOS minimization plan and may include revised related terms and conditions, including revisions to the schedule in the reissued permit.

Because past pollutant minimization plans for other similar pollutants such as mercury have been shown to result in a 43 percent (median) reduction in effluent concentrations and based on relatively low initial concentrations of PFOS and PFOA observed in permittees' effluents, the department predicts that only a couple of industrial facilities (indirect dischargers) in the state will eventually have to install treatment to comply with the PFOS and PFOA standard. In these cases, the proposed rule allows a compliance schedule for installation of treatment technology.

In the event treatment becomes necessary for a WPDES permit holder, pursuant to s. 283.15, Wis. Stats., the permitted facility may apply for an economic variance if installation of treatment technology will cause substantial and widespread adverse social and economic impacts in the area where the permittee is located.

Finally, this rule adds specifications for the preservation and holding times of aqueous, biosolids (sludge), and tissue samples that will be analyzed for PFAS in ch. NR 219, Wis. Adm. Code.

12. Summary of the Businesses, Business Sectors, Associations Representing Business, Local Governmental Units, and Individuals that may be Affected by the Proposed Rule that were Contacted for Comments.

Facilities that may be affected and other interested parties were contacted and given the opportunity to comment on the draft EIA during the public solicitation period. Parties which were contacted include: Wisconsin Manufacturing and Commerce, the Wisconsin Paper Council, the League of Wisconsin Municipalities, Wisconsin Rural Water Association, the Municipal Environmental Group, the Wisconsin Cheesemakers Association, the Midwest Food Products Association, and other interested parties.

13. Identify the Local Governmental Units that Participated in the Development of this EIA.

Treatment facility operators and representatives from affected industries were given the opportunity to comment on the draft EIA during the public solicitation period. The department coordinated with local governments in development of the EIA and provided publicly owned treatment facilities that may be affected the opportunity to comment. Interested parties which were contacted include the League of Wisconsin Municipalities, Wisconsin Rural Water Association, and the Municipal Environmental Group. Both the League of Wisconsin Municipalities and the Municipal Environmental Group submitted comments on behalf of Local Governmental Units, and the department has reviewed these comments and updated Attachment B in response to some of the comments.

14. Summary of Rule's Economic and Fiscal Impact on Specific Businesses, Business Sectors, Public Utility Rate Payers, Local Governmental Units and the State's Economy as a Whole (Include Implementation and Compliance Costs Expected to be Incurred)

The maximum total compliance cost per year of this rule is estimated to be $4,780,613 (maximum in any year).

Specific Businesses and Business Sector:

The maximum annual compliance cost to the Business sector is expected to be $4,005,233 per year.

A detailed assessment of compliance cost to specific businesses, business sectors and small businesses is presented in "Attachment B" to this document. Attachment B details assumptions, number of entities impacted and related compliance cost estimations.

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Fiscal Impact and Impact on State Economy

The department does not anticipate that this rule will impact the state's agencies adversely. Unless the department's Water Quality Program is granted authorization to hire additional positions related to PFAS, any additional workload resulting from this rule will need to be absorbed within the current work schedule of the agency's employees, though this will likely increase workload for existing staff and may shift workload priorities. The department does not anticipate an adverse impact on the state's economy.

Impacts on Local Governmental Units

All costs to publicly owned treatment works (POTW) that are municipally owned are included in the table below. The estimated average compliance costs to local government are $775,380 annually. See the attached narrative for more detail.

Cost Type	Number of POTWs	Annual Costs	Cost per POTW per year	Years Incurred	Total Cumulative 10 yr Cost (over first 10 years after next permit reissuance)
Treatment	0	$0	$0	N/A	$0
PFAS Minimization Plan	23	$315,744	$13,728	8	$2,525,952
Initial Sampling (2 yrs)	142	$1,185,625	$8,350	2	$2,371,250
Sampling (Years 2- 4)	23	$476,100	$20,700	2	$952,200
Sampling (After Year 4)	23	$317,400	$13,800	6	$1,904,400
Total cumulative 10 years of costs					**$7,753,802**
Average Annual Cost*					**$775,380**

*If all POTWs pass on costs to utility rate payers, the department anticipates that no additional costs will be incurred by the POTW.

Impacts on Public Utility Rate Payers

This section assumes POTWs will transfer some compliance cost incurred to rate payers. The department expects that 142 municipalities will incur costs associated with initial sampling for a period of 2 years. Of these, 119 communities are expected to have no costs resulting from this rule other than for sampling. The expected increase in annual sewer rates in these 142 communities is expected to be approximately $0.90/person, this rate increase will be in effect for 2 years while initial sampling efforts are underway, and is expected to be lowered back to the original rate once the facility is shown to have no reasonable potential to exceed the thresholds of public health significance. Because the populations of these communities are unknown, this was derived by dividing the average cost per affected POTW ($8,350) by the average population of a municipality in Wisconsin (5,900,000 Wisconsinites/639 facilities).

Additionally, the department expects that 23 of these 142 affected municipalities are expected to be impacted beyond the initial 2 years of the rule's implementation in a WPDES permit. The expected increase in annual sewer rates in these 23 municipalities varies based on the populations served, but an estimate after the first 2 years is provided below. Because populations and therefore rate increases for 10 POTWs are unknown at this time, the average population from similarly expected POTWs (11,700) was used to estimate the rate increases. The average estimated rate increase across all 23 POTWs is $2.22/person. This was derived by dividing the annual estimated cost ($27,528) by the population of the impacted POTW, then averaging the rate cost across the 23 POTWs. The rate increase is anticipated to be in effect for the duration of the implementation of the PFAS Minimization Plan. This accounts for the significant outliers in population data.

There is no expected increase in sewer rates for rate payers in the other 497 POTWs' sanitary sewer service areas.

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Actual costs are expected to be less for domestic sewer users, as large portions of this increase will likely be paid by industrial users. The department solicited information for POTWs impacted by this rule to assess what, if any, of the compliance costs will be passed on to consumers.

Impacts on Small Businesses
See Attachments A and B.

15. Benefits of Implementing the Rule and Alternative(s) to Implementing the Rule
Revisions to the water quality criteria and effluent limits are likely to lead to improved water quality and reduced risk of illness in people recreating in Wisconsin's waters. While these benefits are difficult to quantify, they are expected to result in an overall benefit to the citizens of Wisconsin.

According to U.S. Environmental Protection Agency (U.S. EPA)[1], the adverse health effects of exposure to PFOA and PFOS include:

- Developmental effects to fetuses during pregnancy or to breastfed infants (e.g., low birth weight, accelerated puberty, skeletal variations);
- Cancer (e.g., testicular, kidney);
- Liver effects (e.g., tissue damage);
- Immune effects (e.g., antibody production and immunity); and
- Thyroid effects and other effects (e.g., cholesterol changes).

A benefit of establishing numeric definitions of public health significance levels for PFOS and PFOA in a narrative standard is that the rule provides clarity and consistency for interpreting the general narrative standard in s. NR 102.04(d), Wis. Adm. Code, for these pollutants. These defined thresholds for implementation provide regulatory certainty for permittees. The department did consider promulgation of numeric criteria for PFOS and PFOA using the procedures in chapter NR 105, Wis. Adm. Code, but decided against this approach. See section 17 for information regarding why this option was not selected.

While an alternative is to not create the statewide PFOS and PFOA narrative water quality criteria with numeric thresholds, there are several disadvantages to that approach. First, as there are documented negative health effects caused by long-term exposure to PFOS and PFOA, the citizens of Wisconsin would be unprotected from risks of exposure from most discharges of PFOS and PFOA to Wisconsin's surface waters. Two groups that may be particularly at risk are those residents who obtain their drinking water from municipal water systems that use surface water as their source, and those who consume fish from waterbodies that contain PFOS. Secondly, Wisconsin residents who own property near areas of known PFAS contamination may experience diminished property values, depressing their personal net worth as well as the wealth of local communities, as evidenced by Minnesota's experience with PFOS contamination from a 3M facility[5]. Thirdly, if PFOS and PFOA remain largely unregulated, Wisconsin's economy may be adversely affected. Recreational anglers may be unwilling to consume their catch from waters with PFOS contamination and may choose to travel to adjacent states that provide fishing opportunities along with the certainty that efforts are underway to reduce PFOS contamination. This in turn may reduce revenues earned from fishing license sales, fishing charters/guides, lodges/cabins, and dining establishments.

Given that data specific to Wisconsin is not yet available, it is difficult to quantify PFOS/PFOA related health impacts in Wisconsin. For the purpose of this EIA, health impacts and recreational value impact studies presented here and the value transfer methods used to estimate potential Wisconsin specific health impacts are based on a number of assumptions. The purpose of this analysis is to give Wisconsin residents an idea (informational purposes only) of the potential economic value (not actual cost) of PFOS/PFOA-related impacts if the assumptions presented here hold. The

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economic value of potential impacts derived from this analysis are not deducted from or factored into the final total compliance costs of this rule.

Health Cost:
To account for costs incurred to the State of Wisconsin as a result of not promulgating a PFOS/PFOA rule, the department analyzed two reports with health data linked to exposure to PFAS.

The first health impact study estimated that the total cost of PFOA-attributable low birthweight births in the United States for 2003 through 2014 was $13.7 billion[2]. These costs included the direct hospital costs at the time of birth as well as lost economic productivity due to low birthweight births being associated with a variety of longer-term outcomes including lower lifetime earning potential.

The department does not have data on PFOS/PFOA-attributable health incidents in Wisconsin. Using a value transfer method, we assumed a linear relationship between impacts of PFOA-attributable low birthweight births quantified by Malits et al. (2018) and the total United States population. The department estimates that, based on 1.8% of the US population living in Wisconsin, the total costs due to low birth weight from PFOA exposure for the period (2003 – 2014) studied by Malits et al. (2018) to be $246.6 million (approx. $ 276.2 million in 2021 dollars). This cost value is likely not robust, given that this is an extrapolation based on non-specific population data, and recognizing that promulgation of both water quality standards and WPDES permit program regulations will not alone end PFAS exposure. However, it shows that it is reasonable to expect significant economic health benefit (avoided cost) as a result of promulgation of these proposed thresholds of public health significance.

The second study examined background exposure to PFOA as it relates to widespread occurrence of hypertension. This study estimated that approximately 10.3 million Europeans would develop hypertension because of this exposure, which would cost Europe an estimated €10.7 – 35 billion[3] annually ($12.6 – 41.3 billion USD). Again, to use the value transfer method, the department assumed a linear relationship between European population and the estimated cost attributable to PFOA exposure. The department also assumed that the occurrence of PFOA-exposure related hypertension in the European population is the same in the United States as well as Wisconsin. Applying this occurrence to Wisconsin, and taking the lower end of that range, it's estimated that it would cost the state $99.9 million annually (approx. $103.9 million in 2021 dollars) for PFOA-exposure related hypertension illness if PFOA is not regulated.

It is important to note that the two studies cited above were specific to PFOA and low birthweights and hypertension. Total health-related costs associated with total PFAS reported by Goldenman, Gretta, et al. (2019) were between €52 billion to €84 billion annually in Europe, which could be several billions of dollars for United States and hundreds of millions for Wisconsin if the quantified values are transferred[4].

Recreation Costs:
Contamination of surface water with PFOS will potentially result in a decrease in use and non-use economic value. Sunding (2017), in a study of the impact of PFOS advisory on a water body and its effect on public visitation to parks estimated that a PFOS advisory decreases the total park visitations by approximately 2.9% (upper bound of 5.9%) within the Minneapolis metropolitan area[5].

This study also found that the economic value of damage to anglers as a result of PFOS contamination in three Minneapolis-area counties (Washington, Dakota, Ramsey) was $28.48 per trip (approx. $31.50 in 2021 dollars) for both popular and unpopular species. If the waterbody is assumed to have a current mercury advisory, the damage related to a PFOS advisory is estimated to be $18 per trip (approx. $19.91 in 2021 dollars).

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Using the average fishing trip per angler (0.51), the total number of anglers (433,603) and a conservative angler average value loss of $18, Sunding (2017), estimated that the annual damage of PFOS contamination to the tri-county anglers to be $3.87 million per year (approx. $4.28 million in 2021 dollars).

Out of 35 waterbodies (mostly in the Madison Metro area) tested by the Wisconsin DNR, 12 PFOS fish advisories have been issued since 2006[6]. This represents approximately 34% of water bodies tested. Given that there are hundreds of recreational water bodies in Wisconsin, it is plausible to assume that PFOS advisories will be issued on more water bodies as the WDNR continues its testing efforts to protect public health. The value of economic damage to anglers can be significant if Wisconsin anglers place a similar value on the damage caused by PFOS advisories as the Minneapolis area anglers ($18 per trip). As a reference, the WDNR estimates that 1.3 million anglers fished in Wisconsin on average 17 days in a year[7].

[1] United States Environmental Protection Agency. Drinking Water Health Advisories for PFOA and PFOS. https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos#:~:text=These%20studies%20indicate%20that%20exposure,)%2C%20liver%20effects%20(e.g.%2C

[2] Malits J, Blustein J, Trasande L, Attina TM. 2018. Perfluorooctanoic acid and low birth weight: estimate of US attributable burden and economic costs from 2003 through 2014. International Journal of Hygiene and Environmental Health 221: 269-275.

[3] Goldenman, Gretta, et al. 2019. The cost of inaction: A socioeconomic analysis of environmental and health impacts linked to exposure to PFAS. Nordic Council of Ministers.

[4] Environmental Science and Technology. The True Cost of PFAS and the Benefits of Acting Now. https://pubs.acs.org/doi/10.1021/acs.est.1c03565

[5] Sunding DL. 2017. Damage to Minnesota's Natural Resources Resulting from 3M's Disposal of PFASs in Washington County, MN. Prepared for the State of Minnesota in the matter of the State of Minnesota v. 3M Company. September 22, 2017.

[6] https://dnr.wisconsin.gov/topic/PFAS/Advisories.html

[7] https://dnr.wisconsin.gov/topic/Fishing/outreach/AdvertisingFishRegulations.html

16. Long Range Implications of Implementing the Rule

The creation of surface water quality criteria for PFOS and PFOA will protect public health by keeping PFAS levels in waterways low, as pollutant minimization activities to reduce or eliminate PFOS and PFOA sources will remove other PFAS compounds as well. If PFAS minimization activities are unsuccessful, then a facility may be required to install treatment to achieve compliance with water quality based effluent limitations. Therefore, costs to implement PFAS Minimization Plans and the potential costs for treatment as well as continued monitoring will be recurring annual costs as estimated in this analysis.

17. Compare With Approaches Being Used by Federal Government

Federal statutes and regulations direct states to establish and periodically review water quality standards. State adoption of water quality standards and revisions to standards require U.S. Environmental Protection Agency (EPA) approval pursuant to 40 CFR 131.20 and 131.21. Pursuant to ch. 283, Wis. Stats., WPDES permitting procedures must be consistent with federal National Pollutant Discharge Elimination System (NPDES) permitting procedures.

- 33 USC s. 1313(c) (section 303(c) of the Clean Water Act) requires that states periodically review and modify or adopt, if necessary, water quality standards. This requirement applies to all surface waters in the state.
- 33 USC s. 1314(a) (section 304 of the Clean Water Act) requires that EPA develop and publish criteria for water quality for all waters for uses such as aquatic life, public health protection, and recreation.
- 40 CFR s. 130.3 defines water quality standards as setting water quality goals for a waterbody that will protect its designated uses (such as protection of fish, wildlife, recreation, and public health and welfare). Criteria will be set to protect those uses.
- 40 CFR s. 131.4 specifies that states are responsible for reviewing, establishing and revising their own water quality standards.
- 40 CFR ss. 131.10 and 11 require states to develop water quality standards including uses and criteria to protect the uses. 40 CFR s. 131.11(b) states that the criteria must be based on federal guidance, federal guidance

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modified to reflect site-specific criteria, or other scientifically-defensible methods.

- 40 CFR s. 131.11 specifies that criteria must protect the designated uses and that criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. Furthermore, states must review water quality data and information on discharges to identify specific water bodies where toxic pollutants may be adversely affecting water quality or the attainment of the designated use or where the levels of toxic pollutants are at a level to warrant concern, and must adopt criteria for such toxic pollutants applicable to the water body sufficient to protect the designated use.
- 40 CFR 131.20 requires states to periodically review water quality standards.
- 40 CFR 132 and Appendices contain requirements for developing water quality standards in the Great Lakes System as well as implementation procedures for the standards and NPDES permitting requirements for point source discharges to the Great Lakes System.
- 40 CFR 123.25 lists the federal regulations in 40 CFR 122 and 124 that states must follow in the administration of the NPDES permit program. State rules must be at least as stringent as these federal requirements.

EPA has neither promulgated specific water quality standards for PFOS or PFOA nor proposed criteria under section 304(a) of the Clean Water Act. EPA typically relies on states to take the initiative and develop water quality standards because states have varying types of fish and aquatic life species and varying types of waterbodies within, and adjacent to, their borders. Occasionally, EPA will specifically direct states to promulgate water quality standards or promulgate procedures for deriving criteria for pollutants in advance of state efforts, and then require that states adopt water quality standards for the pollutant that are at least as stringent as EPA's procedure or standard. EPA has not expressly directed states to develop water quality standards for PFAS at this time, although states do not need EPA approval to begin developing water quality standards and have the discretion to develop water quality criteria for any pollutant. EPA has stated that it has plans to promulgate both aquatic life criteria and human health criteria for PFAS, but any such recommended criteria won't be established for several years.

The method of calculating numeric criteria in s. NR 105, Wis. Adm. Code, reflects such procedures established by EPA for Great Lakes states. As part of this rulemaking effort, the department also conducted preliminary calculations of numeric criteria using the procedures outlined ch. NR 105, Wis. Adm. Code. At this time, however, the department selected a different methodology to develop public health based PFOS and PFOA criteria. Pursuant to s. NR 105.02 (2), Wis. Adm. Code, the department has authority to promulgate a more or less stringent criterion than a criterion calculated under the standard procedures in ch. NR 105, Wis. Adm. Code. The approach selected for deriving the PFOS standard is based on our data analysis which shows that fish consumption is the dominant exposure route of concern for PFOS. The department selected a method that allowed correlation with fish consumption advisories, which would not be included in calculation under ch. NR 105, Wis. Adm. Code. Also, with regard to the calculation of PFOA criteria, the department's calculated criteria are more protective of children that ingest or consume PFOA contaminated water compared to the procedures under ch. NR 105, Wis. Adm. Code. Finally, codifying a method for developing PFOS and PFOA minimization plans will reduce the administrative burden and permitting timelines that would have been associated with processing a large volume of variance requests expected as a result of the criteria developed using the procedures outlined ch. NR 105, Wis. Adm. Code. The department believes that public health-based criteria combined with PFOS and PFOA minimization plans will result in more timely reductions in levels of PFOS and PFOA. The department expects that the selected approach will be effective at reducing sources of PFOS and PFOA in areas of the state where PFOS or PFOA concentrations in wastewater are elevated.

18. Compare With Approaches Being Used by Neighboring States (Illinois, Iowa, Michigan and Minnesota)

The administrative codes of adjacent states contain narrative criteria for the protection of surface waters, although none of the adjacent states' narrative criteria are specific to PFOS or PFOA. The narrative criteria of Illinois, Iowa, and Michigan specifically prohibit concentrations of toxic substances in surface waters in amounts that will adversely affect human health or public health. Minnesota's narrative criteria prohibits discharge of wastes in such quantities that will

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cause pollution as defined by law.
Code citations for these narrative criteria are as follows:

- Illinois: Ill. Admin. Code tit. 35, § 302.210: "Other Toxic Substances. Waters of the State shall be free from any substances or combination of substances in concentrations toxic or harmful to human health, or to animal, plant or aquatic life. Individual chemical substances or parameters for which numeric standards are specified in the Subpart are not subject to this Section."
- Iowa: IAC § 567.61.3(2)(d): "General water quality criteria. The following criteria are applicable to all surface waters including general use and designated use waters, at all places and at all times for the uses described in 61.3(1) 'a.' … 'd.' Such waters shall be free from substances attributable to wastewater discharges or agricultural practices in concentrations or combinations which are acutely toxic to human, animal, or plant life."
- Michigan: R 323.1057, Mich. Admin. Code: "Rule 51. (1) Toxic substances shall not be present in the surface waters of the state at levels that are or may become injurious to the public health, safety, or welfare, plant and animal life, or the designated uses of the waters. As a minimum level of protection, toxic substances shall not exceed the water quality values specified in, or developed pursuant to, the provisions of subrules (2) to (4) of this rule or conditions set forth by the provisions of subrule (6) of this rule. A variance to these values may be granted consistent with the provisions of R 323.1103."
- Minnesota: Minn. Stat. 7050.0210-13: "Pollution prohibited. No sewage, industrial waste, or other wastes shall be discharged from either a point or a nonpoint source into the waters of the state in such quantity or in such manner alone or in combination with other substances as to cause pollution as defined by law. In any case where the waters of the state into which sewage, industrial waste, or other waste effluents discharge are assigned different standards than the waters of the state into which the receiving waters flow, the standards applicable to the waters into which the sewage, industrial waste, or other wastes discharged shall be supplemented by the following: The quality of any waters of the state receiving sewage, industrial waste, or other waste effluents shall be such that no violation of the standards of any waters of the state in any other class shall occur by reason of the discharge of the sewage, industrial waste, or other waste effluents."

Two adjacent states – Michigan and Minnesota – have released numeric water quality values for PFOS, or PFOS and PFOA. Both states developed their values according to the procedures outlined in 40 CFR 132, but each state used different inputs which resulted in different numeric values. Similarly, Wisconsin selected a different methodology and different inputs, as described in Section 9 below, and thus the proposed standards are different. Further, Minnesota released site-specific criteria (SSC) for PFOS rather than implementing the criteria statewide. Michigan has calculated statewide values as Wisconsin is proposing to do. Wisconsin chose not to pursue the development of SSC for this rulemaking effort. Over the past several years, the department has endeavored to collect data on the occurrence of PFAS across the state, and this data indicates the possibility of human exposure to PFOA and PFOS via surface waters or fish taken from surface waters in areas throughout the state. With statewide criteria the department seeks to provide protection for citizens' use of all waters. Additionally, Minnesota's code includes provisions for developing SSCs without rulemaking, but Wisconsin's statutory framework require rulemaking for SSCs. Thus, there would be no administrative time saved or expedited human health protections gained by developing SSCs compared to statewide criteria.

Wisconsin's proposed standard of 8 ng/L for PFOS is slightly more stringent than Michigan's value of 11 ng/L and, compared to Minnesota's PFOS criterion in waters where it applies, less stringent than Minnesota's criterion of 0.05 ng/L. Wisconsin's proposed standards of 20 ng/L and 95 ng/L for PFOA in public drinking water supply waters and non-public drinking supply waters, respectively, are more stringent than Michigan's values of 420 and 12,000 ng/L for PFOA in drinking and non-drinking waters, respectively. The primary reason for the significant difference between Michigan's PFOA criteria and Wisconsin's PFOA criteria is that the reference dose (maximum amount of toxic substance that can be consumed to avoid public health impacts) that Michigan used in its calculations (conducted in 2011) is higher and not

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based on the most recent science. Furthermore, the bioaccumulation factor (BAF) that Michigan used in its PFOA calculation was experimentally derived based on laboratory data while the department used actual field measured fish tissue and water sampling data from surface waters for its PFOA calculations. Federal regulations state that field measured data should be used if available. Finally, Michigan used adult-specific exposure factors (body weight and water ingestion rates) rather than the child-specific factors that the department used. This difference is discussed below in more detail as well as in the technical support document.

Additional information on each adjacent state's approach to developing their values is provided below:

- In 2020, the Minnesota Pollution Control Agency (MPCA) released SSC for PFOS in surface waters and fish tissue for Lake Elmo and two connected waterbodies, Bde Maka Ska and Mississippi River Pool 2. These SSC are not promulgated standards but were developed according to the procedures outlined in 40 CFR 132 pursuant to Minnesota's statutory provisions. Minnesota's administrative code provides the flexibility to implement SSCs without going through rulemaking. The value for fish tissue is 0.37 ng PFOS/g and the value for water that supports the fish tissue criterion is 0.05 ng PFOS/L. MPCA's SSC incorporated the Minnesota Department of Health's toxicity value, which was derived using a model that focuses on the protection of infants and women of childbearing age (WCBA). Accordingly, MPCA's SSC derivation also included WCBA-specific body weights and fish consumption and drinking water intake rates.

  When asked for input from Minnesota on implementation, Minnesota officials responded that they implement their SSC for PFOS in a handful of waterbodies in the Minneapolis-St. Paul metro area – both in the East Metro cleanup area and in other parts. For the most part, PFOS criteria were developed in order to provide appropriate cleanup values for the East Metro and for an area of Minneapolis that has been impacted by a chrome plater. Limitations based on the numeric PFOS SSC described above have not yet been applied in NPDES permits. In 2007, MPCA and STS Consultants, LTD., developed SSC for PFOA and PFOS for Bde Maka Ska and Mississippi River Pool 2. Minnesota has had limited permit implementation of the 2007 criteria; to date, there is only one wastewater plant that has PFAS limits based on these criteria. See: https://www.pca.state.mn.us/waste/water-quality-criteria-development-pfas for more information.

- Michigan Department of Environmental Quality (now called the Department of Environment, Great Lakes, and Energy; EGLE) released statewide water quality values for PFOS in 2014 and PFOA in 2011. The process for calculating surface water quality values, outlined in 40 CFR 132, is promulgated in Michigan's administrative code R. 323.1057. However, values resulting from this process are not promulgated and appear in "Rule 57 Water Quality Values Spreadsheets" available at https://www.michigan.gov/egle/0,9429,7-135-3313_3681_3686_3728-11383--,00.html. Michigan's PFOS and PFOA values apply to surface waters statewide. Concentrations of PFOS may not exceed 11 and 12 ng/L in drinking and non-drinking waters, respectively. Concentrations of PFOA may not exceed 420 and 12,000 ng/L in drinking and non-drinking waters, respectively. Michigan derived their water quality values for PFOA in 2011 (formally published in 2014) with the information that was available at the time. Their values incorporate data from studies where cynomolgus monkeys were exposed to PFOS or PFOA for 182 days (Butenhoff et al. 2002; Seacat et al. 2002). Their selected reference dose (RfD) is based on effects on liver weight and is higher than RfDs that have been subsequently developed based on developmental or immune effects which occur at lower doses. Michigan currently uses a lower RfD, developed by ATSDR, as the basis of their Health-Based Drinking Water Value for PFOA. Additionally, in derivation of their 2011 surface water values, Michigan incorporated a bioaccumulation factor (BAF) of 4 L/kg based on an experimentally derived bioconcentration factor (BCF). Calculating a BAF using at BCF is a method that is less preferred compared to the method of calculating a BAF using field-measured data from fish and water samples according to 40 CFR part 132. During the course of this rulemaking effort, as part of preliminary numeric criteria calculations, the department calculated BAFs for PFOS and PFOA based on field-measured

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data. As noted in Appendix E of the Technical Support Document for WY-23-19, the BAF calculated for PFOA was 40 L/kg, which is higher than the experimentally derived value used by Michigan in 2011.

Michigan implements surface water values for PFOS and PFOA through various water quality programs. Michigan is carrying out an Industrial Pretreatment Program PFAS Initiative, a Municipal NPDES Permitting Strategy, and an Industrial Direct and Industrial Storm Water Discharge Compliance Strategy for monitoring and addressing PFOS and PFOA in regulated discharges. Under the Municipal NPDES Permitting Strategy, municipal permits issued/re-issued after October 1, 2021 will include effluent limits for PFOS/PFOA if applicable. In addition, after July 1, 2021, Michigan will require sampling of biosolids prior to land application as part of a biosolids Interim Strategy. Michigan supports these programs through ambient surface water and fish tissue monitoring.

Iowa and Illinois have not promulgated water quality criteria for any PFAS compounds.

19. Contact Name	20. Contact Phone Number
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This document can be made available in alternate formats to individuals with disabilities upon request.

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ATTACHMENT A

1. Summary of Rule's Economic and Fiscal Impact on Small Businesses (Separately for each Small Business Sector, Include Implementation and Compliance Costs Expected to be Incurred)

The department has determined that there may be an impact on small businesses in Wisconsin. A breakdown of the statewide economic impact on small businesses is provided in the two tables below. The number of affected small businesses was determined based on the number of affected industries discussed in the narrative attached to the EIA (Attachment B). The facilities are all expected to either have reasonable potential to exceed the criteria or be discharging to a POTW that has reasonable potential to exceed the criteria. Consequently, these facilities will, at a minimum, incur costs associated with sampling and development and implementation of a PFOS and PFOA minimization plan or just source reduction activities. See Attachment B to the EIA for further discussion and explanation of the expected treatment costs.

Estimated Number of Affected Small Businesses

Industry Type	Percentages of Small Businesses by Industry Type	Number of Affected Industries	Number of Affected Small Businesses
Metal Finishers	68%	37	25
Paper/Packaging	23%	21	5
CWTs	76%	7	5
Chemical Manufacturers	72%	10	7
Commercial Laundries	70%	8	6
Total			**48**

Estimated Statewide Impact on Small Businesses

Cost Type	Number of Small Businesses	Annual Costs
Treatment	1	$428,126
PFOS and PFOA Minimization Plan/ Source Reduction Measures	48	$658,944
Sampling	48	$993,600
Total		**$2,080,670**

2. Summary of the data sources used to measure the Rule's impact on Small Businesses

To assess the economic impact of this rule, the department sourced cost information for three categories: sampling costs, PFAS Minimization Plan development and implementation costs, and treatment costs. The department reviewed the costs of PFAS wastewater samples at various private and public labs to determine sampling costs. The department used existing cost information obtained by facilities currently implementing mercury pollutant minimization plans and knowledge of staff time and operator pay to assess the costs associated with the implementation and development of PFAS Minimization Plans. Last, the department solicited cost information from several facilities in Wisconsin that have installed PFAS treatment systems in order to estimate treatment costs.

To determine the number of facilities that may incur the costs mentioned above, the department first used effluent data

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obtained through statewide sampling of various publicly-owned treatment works (POTWs) and industries. Based on the number of sampled facilities that were discharging at estimated 30-day P99 concentrations above the proposed thresholds of public health significance for PFOA or PFOS, the department applied those percentages of affected facilities sampled to the total number of facilities throughout the state. The department used data obtained through the "*Identified Industrial Sources of PFOS to Municipal Wastewater Treatment Plants*" document, dated August 2020, and developed by Michigan's Department of Energy, Great Lakes, and the Environment (EGLE). This document provided information on sources of PFOS to POTWs throughout Michigan. Because PFOS, as the more stringent standard, is expected to be the cost driver in Wisconsin (as it was in Michigan), the department focused on those industrial categories outlined in this document.

To obtain an estimate of the total number of facilities in Wisconsin within each impacted industrial sector, the department queried the internal System for Wastewater Monitoring, Applications, and Permits (SWAMP) for Standard Industrial Classification (SIC) codes associated with these industries.

3. Did the agency consider the following methods to reduce the impact of the Rule on Small Businesses?

☒ Less Stringent Compliance or Reporting Requirements
☒ Less Stringent Schedules or Deadlines for Compliance or Reporting
☒ Consolidation or Simplification of Reporting Requirements
☒ Establishment of performance standards in lieu of Design or Operational Standards
☒ Exemption of Small Businesses from some or all requirements
☐ Other, describe:

4. Describe the methods incorporated into the Rule that will reduce its impact on Small Businesses

In order to comply with this rule, affected small businesses will need to develop and implement a PFOS and PFOA minimization plan to reduce PFOA and PFOS concentrations from their effluents. In order to develop this plan, small businesses will need to research known sources of PFOA and PFOS as they apply to their specific processes and make efforts to eliminate or minimize those sources. This will require the affected small businesses to have knowledge of how to use the internet, communication skills to solicit information from other affected entities, and documentation skills to show what actions have been taken.

All affected small businesses will also need to learn how to obtain a representative sample from their discharge, whether it is a direct discharge to surface waters or an indirect discharge to a POTW. Although permitted small businesses are familiar with effluent sample collection, because of the high potential for cross-contamination when sampling for PFAS, these procedures may be different than how facilities currently sample their effluent. For small businesses that have a direct discharge, their sample results are submitted on monthly Discharge Monitoring Reports (DMR). Small businesses with WPDES permits are familiar with DMR reports. For small businesses that discharge to a POTW, the small business can submit the PFOS or PFOA results directly to the POTW consistent with existing standard reporting procedures.

The department estimates that there will potentially be one small business that may need to install treatment. This will require the small business's current treatment system operators to research the requirements to properly operate a granular activated-carbon treatment system. A compliance schedule may be granted to install treatment.

Although not expected, in the event a small business with a WPDES permit (direct discharger) had to install treatment to comply with the PFOS or PFOA standard, the small business could apply for an economic variance pursuant to s. 283.15, Wis. Stats., if treatment costs would result in widespread adverse social and economic impacts. Without specific financial and employment information for a small business variance applicant, it is impossible for the department to determine at this time whether any applicant would qualify for a variance.

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The department has considered the methods outlined in s. 227.114(2)(a) to (e), Wis. Stats., and has concluded that, based on existing state and federal regulations, the department cannot exempt small businesses from sampling and reporting requirements or provide a relaxed schedule simply based on the size of a business. The department also cannot exempt small businesses from compliance with the water quality standard. Wisconsin's WPDES permit program is based on the requirements in ch. 283, Wis. Stats., and the state's permitting program must be consistent with federal NPDES permit requirements established in the Clean Water Act and applicable federal regulations. Federal regulations do not allow less stringent limitations or compliance schedules categorically for small businesses. Although not specific to small businesses, the proposed rule does allow for less-frequent sampling for permittees on a case-by-case basis, and if a small business is not expected to discharge PFOA or PFOS into surface waters, the business doesn't have to sample for these pollutants and would not be subject to the requirements of this proposed rule.

5. Describe the Rule's Enforcement Provisions

This rule is enforceable under the WPDES program, which is based on the requirements in ch. 283, Wis. Stats., and must comply with federal NPDES requirements established in the Clean Water Act. If a facility was found to not be adequately implementing a pollutant minimization plan (PMP) as required by its WPDES permit, the department may take stepped enforcement actions to bring that facility into compliance. If a facility were to receive a water quality-based effluent limit after 85 months of PMP implementation and subsequently exceed that limit, the department may take stepped enforcement to bring that facility into compliance. Pursuant to s. 283.89, Wis. Stats., for any alleged violations of the WPDES permit or rules promulgated under ch. 283, Wis. Stats., the department is required to refer the violations to the Department of Justice and those violations are subject to the penalties, injunctive relief and other costs under ss. 283.87 and 283.91, Wis. Stats.

6. Did the Agency prepare a Cost Benefit Analysis (if Yes, attach to form)

☐ Yes ☒ No A formal CBA was not performed, but an evaluation of costs/benefits was done. Refer to questions 14 and 15 above.

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ATTACHMENT B

See EIA Narrative document