Attachment B:
Supplemental Information for the Antidegradation Rule Economic Impact Analysis, Board Order No. WY-13-20

WDNR, February 15, 2023

Introduction

Maximum Annual Costs: $1,652,484
Maximum 2-Year Costs: $2,484,384

The proposed rule package intends to update Wisconsin's antidegradation policy and implementation procedures to establish an effective, transparent process for conducting antidegradation reviews consistent with federal regulations. Antidegradation reviews are a federally required component of surface water quality standards. They are established to protect existing uses and prevent degradation in high quality surface waters. A state's antidegradation policy and implementation procedures do not prohibit all activities that would otherwise lower water quality in high quality waters. However, they require a demonstration that lowering of surface water quality is necessary to support important social or economic development in the area where the waterbody is located. States are required to adopt an antidegradation policy and implementation procedures that are consistent with the Clean Water Act and federal regulations promulgated under the Act (33 USC 1313(d)(4)(B), 40 CFR 131.12, and 40 CFR 132 Appendix E).

This document outlines cost areas for three types of WPDES permittees: wastewater, stormwater, and concentrated animal feeding operations (CAFOs). All costs identified in this document are in 2022 dollars.

Wastewater Permittees

Summary of Cost Estimate Methodology

In determining the statewide economic cost of this proposed rule, the department evaluated three primary areas of costs: 1) the costs to develop an alternatives analysis, 2) sampling costs incurred by facilities needing to evaluate the background (ambient) quality of the receiving waterbody or waterbodies, and 3) the costs incurred by facilities that choose a less-degrading alternative based on the alternatives analysis.

1) To estimate the costs of developing alternatives analyses, the department first evaluated the most recent 30 Wisconsin Pollutant Discharge Elimination System (WPDES) permit water quality-based effluent limit (WQBEL) memos in the state to assess the number of facilities that made an antidegradation demonstration. Both industrial and municipal facilities were included in this pool of facilities. Staff examined which of these facilities would be required to show that significant lowering of water quality cannot be prevented in a cost-effective manner by means of an alternatives analysis. Then, the department applied the percent of facilities required to complete alternatives analyses in the sample set to the total number of permittees in the state whose permits were reissued each year in order to extrapolate the total number of facilities that would potentially be affected by this rule. After obtaining this number, the department then solicited cost information for the creation of an alternatives analysis from several private sector consultants in the wastewater industry working in Wisconsin.

2) For costs of sampling background water quality to quantify assimilative capacity, the department first received cost estimates from the Wisconsin State Laboratory of Hygiene that were determined to be

representative of the typical suite of parameters that permittees seeking an antidegradation demonstration would likely sample. To evaluate the likely increase in the number of facilities that may be required to monitor background water quality, the department made the assumption that, of those facilities submitting an alternatives analysis, twice as many would need to evaluate background water quality. This is a conservative assumption because the department has conducted sufficient monitoring to quantify assimilative capacity in most of the main waterbodies in the state. Monitoring would not be required on waterbodies without background flow, so this requirement would most likely apply to new or increased discharges on certain moderately small waterbodies. Therefore, the number of facilities required to monitor to quantify assimilative capacity is expected to be fairly rare.

3) In order to estimate the occurrence of facilities changing their plans due to selection of one of the alternatives identified in the alternatives analysis, the department internally polled all WPDES permit drafters statewide to see how often this situation occurs under the current antidegradation code requirements, which also require analysis of treatment alternatives. No facilities were identified as having chosen an alternative to date, so this situation may not have occurred under the current rule, or at least has not occurred in the past decade. However, with the anticipated increase in the number of facilities submitting an alternatives analysis due to the change in the significance threshold, the department made the conservative assumption that approximately one publicly-owned treatment work (POTW) per year would choose a less-degrading alternative in order to proceed with a new or increased discharge. This number is based on the fact that selection of an alternative has not been documented to have occurred under similar requirements of the current rule, and the department has not been provided with specific cases where this is likely the case in the future. One facility a year is chosen for cost estimation purposes, but the department believes this is likely an overestimation of the anticipated frequency of occurrence.

Affected Facilities - Wastewater

After reviewing the 30 most recent water quality-based effluent limit memos in the state, the department identified two facilities that would potentially have been affected by the new rule language.

The first permittee proposed to change the location of an outfall from one waterbody to another. Prior to doing this, the permittee was required to submit a demonstration that the relocation was necessary to accommodate one or more of the important economic or social development conditions currently listed in s. NR 207.04(1)(c), Wis. Adm. Code. The proposed rule will not change these requirements, because the discharge from the relocated outfall is considered a “new” or “increased” discharge under both the current and proposed rule, which requires an antidegradation review. The one area where this permittee is affected by the proposed ch. NR 207, Wis. Adm. Code, rule change is in the calculation of WQBELs for phosphorus, although this would not result in additional costs for the permittee. Under the current rule, two sets of phosphorus WQBELs for this permittee were calculated using both 33% of the available assimilative capacity and 100% of the available assimilative capacity, with the permittee needing to submit an alternatives analysis in order to receive a limit based on the latter. Under the proposed rule, this permittee would instead have a 60% reduction in the calculated WQBEL (using 10% of the assimilative capacity versus 33%), or would need to submit an alternatives analysis to be eligible for less stringent limits. Due to the permittee’s current effluent levels, the permittee would need to

submit an alternatives analysis under both the current or proposed rule, and thus would experience no additional costs under the proposed rule.

The second identified permittee is a temporary new discharger which has demonstrated that one or more of the important economic or social development conditions listed in s. NR 207.04(1)(c), Wis. Adm. Code, has been satisfied. Under the current rule, this permittee's discharge has been shown to not use more than 33% of the available assimilative capacity for any of the parameters which are sampled, and thus the department has determined that the discharge will not result in significant lowering of water quality and the permittee can receive WQBELs calculated under ch. NR 106, Wis. Adm. Code. However, under the proposed rule, the department would likely make the determination that this discharge would result in significant lowering of water quality because more than 10% of assimilative capacity is used in the receiving water. Therefore, under the proposed rule this permittee would incur an additional economic cost in the form of development of an alternatives analysis.[1]

Based on the above analysis, the department expects that 2/30 facilities (or 6%) would be subject to different requirements as a result of this rule package. Although only 1/30 of the facilities analyzed (or 3%) are projected to incur costs as a result of the proposed rule, the department estimates that at least half of all facilities subject to different requirements as a result of the rule would incur the cost of developing an alternatives analysis. This amounts to 3 – 6% of permit issuances or reissuances each year, or about 5 to 10 facilities per year, that may need to develop an alternatives analysis where they previously would not have been required to do so. See below for an explanation of forecasted costs for these impacted facilities. The department also evaluated instances where a facility would initially be granted an increase, which would not require a full antidegradation review to be completed, and then that same facility requested an additional increase for the same pollutant later on. The department is unaware of this situation happening previously. This makes sense, given that facilities design their treatment plants to meet the original effluent limits that they receive, so if a facility designed their treatment plant to use 10% of the assimilative capacity, it's unlikely that a facility would later request additional assimilative capacity. The department is not aware of this situation being encountered in the previous 10 years. Furthermore, the estimated occurrence of facilities submitting an alternatives analysis included in this economic impact analysis is already likely an overestimation, so this situation is anticipated to be accounted for in the existing pool of anticipated facilities.

The department assumed that more facilities will need to sample to determine background water quality than will be required to develop an alternatives analysis. To determine the number of affected facilities, the department estimates that half of the facilities that perform sampling as part of the antidegradation demonstration would ultimately be required to also submit an alternatives analysis. This is due in part to the limited number of facilities already under the current code which perform background water quality sampling. This results in a range of 6 – 12% of facilities statewide performing this sampling, or 10 – 20 facilities per year.

As summarized in the methods section above, the department is assuming that one POTW per year would both submit an alternatives analysis and choose a less degrading alternative to proceed with a new or increased discharge. This number is based on the fact that selection of an alternative has not

[1] Temporary discharges are subject to antidegradation review, unless exempted under 40 CFR 132, Appendix E, II.F1., which applies to discharges of BCCs to the Great Lakes system. However, most temporary dischargers are permitted under general permits, which do not require the applicant to conduct an alternatives analysis.

been documented to have occurred in the past decade, and the department has not been provided with specific cases where this is likely the case in the future. One facility a year is chosen for cost estimation purposes, but the department believes this is likely an overestimation of the anticipated frequency of occurrence.

Sampling Costs

A summary of the sampling costs the department obtained from the State Laboratory of Hygiene can be found below in Table 1. This lab did not provide a dissolved oxygen sampling cost, so the department obtained the cost of these field test kits from a search through online vendors. As stated previously, the only additional sampling costs wastewater permittees might encounter as a direct result of this proposed rule is in those situations where a facility will need to collect surface water samples to determine background water quality in order to calculate effluent limits and determine whether a waterbody is considered high quality for certain parameters. The department has already conducted extensive sampling for a variety of pollutant parameters to classify the condition of the largest waterbodies in the state, so these costs will only be for dischargers to small or moderately-sized waterbodies. While surface water samples may be required, the department does not anticipate that WPDES permittees will be required to perform more effluent sampling because of this proposed rule.

These parameters were chosen based on existing parameters identified in ch. NR 207, Wis. Adm. Code, with the addition of phosphorus, given the potential for phosphorus to be a contaminant of concern for facilities seeking antidegradation evaluations. The facility will need to sample those parameters that they are proposing to increase in their discharge. In some cases, sampling of surrogate parameters directly related to the impact of the pollutant of concern may be required (for instance, dissolved oxygen (DO) and 5-day biochemical oxygen demand (BOD5), or metals and hardness). Consultant time devoted to collecting the surface water quality sample is also included, assuming a pay rate of $100/hour (based on cost estimates provided to the department during this EIA's public comment period) for two consultants, and two hours devoted to collecting one sample.

Table 1 - Sampling Cost Estimates

Parameter	Cost per Sampling Event
Dissolved Oxygen (Field Test Kit)	$54.00
5-day Biochemical Oxygen Demand (BOD5), Total	$72.00
Nitrogen, as Ammonia	$32.00
Copper, Total Recoverable	$39.00
Phosphorus, Total	$28.00
Shipping	$75.00
Time to collect water quality sample (2 consultants/2 hours each)	$400.00
Total:	**$700.00**

The number of sampling events a permittee would need to perform is likely site-specific and dependent on factors such as variability of the data and how much data has already been collected onsite. The

department estimates these facilities will need to take anywhere from 2 – 12 samples in a year to characterize the condition of the receiving waterbody.

Costs to develop an Alternatives Analysis and Social or Economic Analysis

This analysis did not take alternatives analysis costs into consideration for new municipal dischargers due to practicable alternatives already being extensively considered as part of the facility planning process. The department does not anticipate that the proposed changes to ch. NR 207, Wis. Adm. Code, will result in additional costs to facility plans.

This analysis also did not take into account costs pertaining to the anticipated increase in the number of facilities that will need to make a demonstration that the appropriate social and economic development conditions are satisfied. Because this demonstration requires less time and effort to complete compared to the development of an alternatives analysis, the department anticipates that this type of work can be accomplished using existing personnel and under current operating budgets. The department believes that these demonstrations can be absorbed into existing costs given that the expectation for these types of analyses is less involved (i.e., the analysis is not a full-blown socioeconomic analysis) and information on the social and economic considerations are typically readily available to facilities. Furthermore, to date, the department has accepted social and economic demonstrations which were relatively short in length (one to five pages) and performed in-house without the input of a consultant retained by the facility.[2]

To determine the cost of retaining a consultant to create an alternatives analysis, the department solicited cost information from consultants with experience drafting alternatives analyses for various other pollutants such as facility upgrades for phosphorus. Compliance costs may vary widely based on several factors, including: facility type (industrial or municipal), facility size, community size, treatment technologies currently utilized, and the impairment status of the receiving waterbody. To account for these variables, the department used cost estimates that were reasonably expected to be applicable based on the average size of a facility in the state, in addition to incorporating a range of expected values. The department reached out to 10 private sector consulting firms that have experience in alternative analysis evaluations in Wisconsin and received cost estimates from two of them. The first firm placed the expected cost for this type of analysis at $25,000. The second firm placed the expected cost in the range of $30,000 to $80,000, with a 1 – 2 million gallons per day (MGD) wastewater treatment plant anticipated to incur around $50,000. Most POTWs in the state have design flows less than 2MGD. Additionally, a bidding process typically occurs when facilities are seeking a consulting firm

[2] During the EIA comment period, a commentor suggested that costs associated with the proposed social or economic importance analysis should be compared to the costs of this analysis in Minnesota, on the basis that the proposed rule mirrors Minnesota's requirements. The department does not agree with this statement. The proposed rule has both similarities and differences with the antidegradation rules in surrounding states, as described in the Board Order. In this instance, the social and economic importance requirements in proposed rule section NR 207.03(8)(b) are less extensive than the procedure under MINN. R. 7050.0265 Supb. 5.B., which lists fewer factors that would demonstrate economic or social importance and considers these factors against the value of the water resource.

for this type of work, and the department anticipates that the mid-to-lower range of the second consultant's estimates to be representative of the actual costs to be incurred on a statewide basis.

Based on this solicitation, the department estimates that each affected permittee would spend $35,000 - $50,000 on a alternatives analysis. This is a one-time cost. Multiplying this range by the 5 to 10 facilities affected each year, the total statewide compliance cost for wastewater WPDES permittees is likely in the range of $175,000 - $500,000/year. This is a conservative statewide estimate due to the low likelihood that up to 10 permittees each year will be required to perform a full antidegradation review.

Chosen Alternative Costs

Under the proposed code language, an alternatives analysis would require the following:

1) A description and analysis of a range of practicable alternatives that have the potential to prevent or lessen the degradation associated with the proposed discharge. Include a description of any alternative determined to be impracticable, and why that determination was made.
2) For each of the practicable alternatives above, identification of receiving water quality and accompanying environmental impacts on the receiving and downstream waters, including impacts to aquatic life and public health in downstream communities.
3) Evaluation of the cost for each of the practicable alternatives in 1).
4) Identification of a proposed practicable alternative that prevents or lessens water quality degradation while also considering accompanying cross-media environmental impacts (example: impacts to air quality). If the applicant has selected an alternative that results in no degradation to the receiving water, the social or economic importance analysis is not required.

In determining which practicable alternatives might be available to facilities for cost estimation purposes, the department identified the following categories of potential practicable alternatives: (1) operational measures such as source reduction, conservation, or recycling measures, and (2) additional wastewater treatment.

The costs applicable to conservation measures, recycling measures, source reduction measures, operational changes, and use of other pollution minimization alternatives are grouped together as similar cost areas, as staff time devoted to them would generally be the same. Staff time is the long-term cost driver for implementing source reduction, conservation, and recycling measures, in addition to operational changes. It will take staff time to review relevant historical documents on potential recycling and contamination routes, and reach out to various organizations/suppliers/pretreatment industries for resources with regards to pollutant source reduction and operational changes to the facility. With an assumed pay of $23/hr (based on the median pay of Wastewater Operators in the state of Wisconsin in 2022), the department estimates that 10% - 25% of these individuals' time (1 individual per facility) would be devoted to implementing actions identified in the alternatives analysis. As

opposed to sampling and other cost areas, this specific cost area is an ongoing cost instead of a one-time cost. These costs are summarized below in Table 2.

Table 2 - Cost Estimates for Pollution Control Measures

Pay Rate ($/hour)	Low End Staff Time (hours/year)	High End Staff Time (hours/year)	Low End Cost Per Facility	High end Cost Per Facility
$23.00	208	520	$4,784	$11,960

The costs of the use of other applicable wastewater treatment processes as an alternative are more nebulous, as these costs could mean the installation of new treatment systems or the replacement of old equipment. This scenario is not anticipated for several reasons:

1. As indicated previously, choosing any one alternative from an alternative analysis is exceedingly rare; so rare, in fact, that the department was unable to find a case study to base any cost assumptions from it. To the department's knowledge, no facility in Wisconsin has proposed to install new treatment to meet effluent limitations under the department's current antidegradation rules, which also require consideration of treatment alternatives.
2. When facilities select to upgrade treatment facilities, there are typically a myriad of reasons for doing so. For example, if an industrial permittee's treatment facility is undersized and the permittee is seeking an increase in limitations because of increased production, upgrades to the treatment facility would likely be addressed to properly size the facility before the permittee got to the point at which they would go through antidegradation procedures. The same applies to municipal permittees, given that they're sized based on community growth and would upgrade treatment facilities to accommodate increased growth.
3. The proposed rule does not require a facility to select a particular less-degrading alternative – if lessening of degradation can be achieved through optimization of existing treatment plant or source reduction, the department would prioritize those methods as the practicable alternative.
4. The department solicited comments on this economic impact analysis, and, while cost estimates for treatment systems were provided, the information was too general for the department to find these costs are reasonably expected to be incurred under the revised rule. These cost estimates did not identify which facilities in the state were likely to install these treatment system upgrades as a direct consequence of this proposed rule. In addition, these costs estimates did not separate the treatment costs required to comply with existing rules from the costs estimated to comply with the proposed rule. They also did not provide information to help determine whether treatment upgrades would in fact be considered a practicable alternative, or whether optimizing existing treatment or other source control measures would also be a practicable alternative.

The department would only include treatment costs as part of this economic impact analysis if new wastewater treatment expenses were reasonably expected to be incurred because of this proposed rule. Given that (a) this situation not happened in at least a decade under similar existing requirements, (b) it is unlikely to occur simply because the significance threshold is being lowered, (c) other practicable alternatives such as optimization are more likely to be chosen over treatment, and (d) the department has been unable to locate a case where this likely would happen, the department cannot make the

reasonable conclusion that facilities would install new treatment systems as a result of a change in the threshold that would require an alternatives analysis.

Stormwater Permittees

Summary of Cost Estimate Methodology and Background

The department's storm water program covers most construction and industrial facilities under general permits and has proposed rule language that is intended to continue to allow most permittees to be eligible for coverage under these general storm water permits. Under the proposed rule, the department shall condition general permits to meet the antidegradation policy. As part of this process, the department would make a preliminary determination that the permit conditions satisfy the antidegradation policy during the public notice period and would make a final determination during general permit issuance.

A permittee would incorporate or implement these conditions into their plans or operations to prevent a lowering of water quality if there were a proposed new or increased discharge to a receiving water identified as a high quality water in the proposed rule within one-quarter mile of their facility.

Permittees are currently required to identify receiving waters, including downstream waters, that are designated as an exceptional resource water, an outstanding resource water, or an impaired water. The storm water construction program currently has site map requirements for construction sites that require an applicant to show where stormwater is discharged to a surface water within one-quarter mile downstream of the construction site. To create a standardized approach for all facilities, the storm water program assumed that this distance would represent a conservative value for identifying discharges likely to reach a receiving water during a storm event.

Proposed practices a permittee may be required to implement to prevent a lowering of water quality include the same practices commonly used by construction and industrial permittees currently; however, the practices may need to be modified in time scale or measure depending on site characteristics. The program expects a nominal increase in costs for a permittee that will be covered under a general permit for construction and industrial activities. For a facility that was unable to meet the general permit conditions, additional costs would be incurred and are separately accounted for in the analysis under the affected facilities section.

In determining the economic costs to storm water discharges under the proposed rule, the department considered costs associated with application fees, sampling, data collection and analysis, engineering/consultant costs, costs associated with the installation of treatment best management practices (BMPs), and costs associated with operation and maintenance of specialty filtration systems related to non-conventional pollutants.

The department did not include costs associated with a temporary lowering of water quality exempted under 40 CFR 132, Appendix E, II.F1., which applies to discharges of a bioaccumulative chemical of concern (BCC) to the Great Lakes system, since there are no costs associated with allowing an exemption. Where a discharge would not be temporary in nature, another environmental program would have regulatory authority over the discharge.

Storm Water Permittees with Discharges to a High Quality Receiving Waterbody Listed by Type

The department evaluated the number of permitted construction and industrial facilities (Tier 1, Tier 2, Non-Metallic Mining, Dismantling of Vehicles for Parts Selling and Salvage, and Recycling of Scrap and Waste Materials) located within one-quarter mile of a high quality waterbody listed by type under the proposed rule language (including those waters defined as outstanding resource waters, as listed under s. NR 102.10; exceptional resource waters, as listed under s. NR 102.11; and outstanding national resource waters, as described under 40 CFR Part 132, Appendix E, II. A, for which the department currently has none listed. Consistent with the note in the proposed rule, to be conservative in this analysis the storm water program assumed that all downstream tribal waters are considered outstanding resource waters). The next section contains the analysis and explanation for all other high quality waters that are not listed by type.

The department did not conduct additional analysis on municipal permittees, as most new or increased discharges within a municipality's permitted area would fall into the construction analysis for this section.

The department conducted the following spatial analysis for discharges that would constitute a new or increased discharge:

- Permitted construction sites during State Fiscal Year (SFY) 2021 and 2022, within one-quarter mile of an outstanding resource water (ORW), exceptional resource water (ERW), great lakes water (GLW), and tribal waters (TOERW) that have been approved by the United States Environmental Protection Agency (USEPA).
- Total permitted Tier 1 Industrial facilities within one quarter mile of an ORW, ERW, GLW and TOERW, and newly permitted facilities during SFY 2021 and 2022.
- Total permitted Tier 2 Industrial facilities within one quarter mile of an ORW, ERW, GLW and TOERW, and newly permitted facilities during SFY 2021 and 2022.
- Total permitted Non-Metallic Mining Facilities (NMM) classified as externally drained located within one quarter mile of an ORW, ERW, GLW and TOERW, and newly permitted facilities during SFY 2021 and 2022.
- Total permitted Auto Dismantling Industrial facilities within one quarter mile of an ORW, ERW, GLW and TOERW, and newly permitted facilities during SFY 2021 and 2022.
- Total permitted Scrap Recycling Industrial facilities within one quarter mile of an ORW, ERW, GLW and TOERW and newly permitted facilities during SFY 2021 and 2022.

The following table represents the number of permitted construction sites (359) and industrial facilities (145) that are located within a one-quarter mile of a high quality water body listed by type in the proposed rule.

Table 3 - Number of Permitted Facilities Located within One-Quarter Mile of Specified Water Type

	ORW	ERW	GLW	TOERW	Total
Construction Permits (SFY 21 and 22 only)	82	161	112	4	359
Tier 1 Permits	4	10	7	0	21
Tier 2 Permits	4	30	42	0	76
Externally Drained NMM Permits	9	22	6	0	37
Scrap Recycling Permits	0	2	0	0	2
Auto Dismantling Permits	1	8	0	0	9

The following table represents the number of facilities permitted in SFY 2021 and 2022 located within one-quarter mile of a high quality waterbody listed by type that could be considered a new discharge.

Table 4 - Number of Permitted Facilities in SFY 2021 and 2022 Located within One-Quarter Mile of Specified Water Type that could be considered a new discharge

	ORW	ERW	GLW	TOERW	Total
Construction Permits (SFY 21 and 22 only)	82	161	112	4	359
Tier 1 Permits	0	1	0	0	1
Tier 2 Permits	1	2	0	0	3
NMM Permits*	3	0	0	0	3
Scrap Recycling Permits	0	0	0	0	0
Auto Dismantling Permits	0	0	0	0	0

*Note: This number includes all permitted NMM facilities in SFY 2021 and 2022, as most facilities are classified as externally drained for the first few years of permit coverage until they contain storm water discharges for a minimum of a 24 hour, 25-year storm event.

Storm Water Permittees with Discharges to Receiving Waterbodies Defined as Other High Quality Waters

The analysis and explanation in this section includes all other surface waters designated as a high quality water where water quality is better than a water quality standard for an existing or designated use, as determined by the department on a parameter-by-parameter basis. High quality waters include surface waters where there is assimilative capacity in the receiving water for any parameter in a proposed new or increased discharge.

The storm water program assumes that in most circumstances the existing implementing regulations and performance standards are sufficient to prevent a lowering of water quality in other waterbodies that may be classified as an other high quality water. Since these regulations currently exist, the program does not expect any additional costs to be incurred.

For example, most construction and municipal discharges address total suspended solids for projects engaging in land disturbing construction activity of one acre or more, and require a permittee to utilize BMPs to reduce total suspended solids carried in runoff from the post-construction site. For these projects, total suspended solids are generally also a surrogate for other pollutants that may be mobilized in storm water; these pollutants are not likely to result in a lowering a of water quality when performance standards are implemented. For the purposes of this analysis, the department has assumed that additional antidegradation analysis will not be required for conventional pollutants and their surrogates at construction and municipal facilities discharging to other high quality waterbodies.

For industrial permittees, facilities that do not qualify for no-exposure certification are already required to implement good housekeeping practices, source area controls, and treatment controls in a Storm Water Pollution Prevention Plan. The storm water program assumed that for other high quality waters there would be limited circumstances where it was determined, on a parameter-by-parameter basis, that the discharge of pollutants associated with an intermittent storm water discharge would result in a lowering of water quality. While unlikely to occur, the department has included costs for one additional facility per two-year cycle in the industrial new discharge category.

Construction

Most construction sites will qualify as a new discharge. However, department staff assume that most facilities will be able to meet permit conditions designed to prevent a lowering of water quality in the receiving high quality water where no additional costs would be incurred beyond what a facility is currently paying.

Department staff identified circumstances where the permit conditions reflective of performance standards in ch. NR 151, Wis. Adm. Code, may not prevent a lowering of water quality. This circumstance may occur when a construction site permittee requests to implement the total suspended solids (TSS) performance standards of ch. NR 151, Wis. Adm. Code, to the maximum extent practicable (MEP).

For SFY 2021 and 2022, department staff estimated that an average of 1.31% and 1.43%, respectively, of construction sites sought department approval to implement the TSS performance standards of ch. NR 151, Wis. Adm. Code, to the MEP. For purposes of this analysis, the department assumed that annually 1.5% of construction sites would seek department approval to implement the TSS performance standards of ch. NR 151, Wis. Adm. Code, to the MEP. As shown in Table 3, the department permitted a total of 359 construction sites in SFYs 2021 and 2022 within one-quarter mile of a high quality waterbody listed by type under the proposed rule. The department applied the assumed 1.5% of sites implementing pollutant reductions to MEP to the total number of permitted construction sites within one-quarter mile of a high quality waterbody listed by type in SFYs 2021 and 2022. The result identified 5.38 construction sites over a two-year period that would likely discharge to a high quality waterbody listed by type. The program has rounded this approximation to six sites every two years for cost analysis purposes. As stated above, for other high quality waterbodies (i.e., those not listed by type), the department assumes that discharges that comply with existing implementing regulations and performance standards are sufficient to prevent a lowering of water quality.

The department expects that permittees seeking a TSS MEP option may choose to conduct additional modeling and analysis to demonstrate a lowering of water quality is not occurring for high quality waterbodies listed by type under the general permit. Under this assumption, a permittee may demonstrate the discharge is less than or equal to the average annual load from the construction site in the pre-development condition as defined under s. NR 151.002, Wis. Adm. Code to be eligible for coverage under a general permit.

For costs associated with these assumptions, the storm water program assumed three sites per year would be impacted and a total of three hours would be needed to complete the analysis utilizing common modeling software (compiling the data and incorporating the data into the construction submittal materials), with an average engineering rate of $100 per hour. Under these conditions, the department estimates the additional costs under the proposed rule would be $900 per year as shown in Table 5:

Table 5 - Estimated Annual Construction Permittee Costs Associated with an MEP Claim

Hourly Rate ($/hour)	Hours per facility	Number of facilities	Total Statewide Cost
$100	3	3	$900

Industrial Stormwater, New Discharge

As shown in Table 4, in SFY 2021 and 2022, the department permitted seven industrial facilities that were located within one-quarter mile of a high quality water listed by type. The storm water program is proposing to draft permit conditions that are expected to continue to cover most facilities under the general storm water permit, therefore, no additional costs would be incurred for facilities that qualify.

However, the department has assumed, for the purpose of this analysis, that at least one industrial facility every two years would be unable to utilize the conditions of the general permit to prevent a lowering of water quality in a high quality water listed by type. The department also included costs for one additional industrial facility per year for limited circumstances where it was determined on a parameter-by-parameter basis that the discharge of pollutants associated with an intermittent storm water discharge would result in a lowering of water quality in other high quality waters. In both scenarios, an industrial permittee would be required to obtain an individual permit (IP) for the discharge, which would result in a $500 application fee. The department assumed that water quality data was not available and would need to be collected to determine background in-stream concentrations. Cost assumptions of $8,400 per year were associated with determining the background concentration of the receiving water, where in-stream water samples were collected and sent to a laboratory for chemical analysis. A cost of $300 per sampling event (typical parameters are shown in Wastewater Table 1) was associated with the shipping and lab analysis. The department assumed that the stormwater permittee would need to pay an engineering or environmental firm the costs associated with collecting the in-stream samples. For these costs, the department assumed it would take two people (at a pay rate of $100 per hour per consultant) an average of two hours to collect the in-stream samples. Thus, for each sampling event, an additional $400 for time would be incurred. The total costs incurred for each sampling event would be $700 (the collection costs, plus the analysis and shipping

costs). For the purposes of this analysis, the department assumed that it was necessary to collect monthly samples over a period of one year to determine the background concentration, although this is likely an overestimate.

The permittee would also be required to conduct an alternatives analysis and select a less-degrading alternative for implementation. The department estimated a combined cost of $3,000 - $20,000 for consultant/engineering fees associated with modeling, analysis, and reporting. The department chose to use the highest estimate of $20,000 for this analysis. The department assumed that some facilities may require a more robust analysis to account for a range of alternatives that have the potential to prevent or lessen the degradation associated with the proposed discharge. The department assumed as a worst-case scenario, that an additional $15,000 per facility could be incurred for an engineering firm to develop alternatives, provide detailed information on the alternatives, and provide supporting information for why the alternatives are impracticable. The cost for the alternative analysis would be slightly less than the combined cost for engineering costs, since much of the information (i.e., soil testing and site surveys) would have already been completed for the chosen site design where land availability, site constraints, and affordable technologies or logistics could be considered.

The permittee is also required to gather and provide sufficient information to demonstrate that the project is needed to accommodate important social or economic development in the area where the receiving water is located. Because this demonstration requires less time and effort to complete compared to the development of an alternatives analysis, the department anticipates that this type of work can be accomplished using existing personnel and under current operating budgets. The department believes that these demonstrations can be absorbed into existing costs given that the expectation for these types of analyses is less involved (i.e., the analysis is not a full-blown socioeconomic analysis) and information on the social and economic considerations are typically readily available to facilities. The department anticipates that social and economic demonstrations that are relatively short in length (one to five pages) and performed in-house without the input of a consultant retained by the facility should be sufficient.

Since treatment BMPs represent the higher end of costs, the department chose to reflect the implementation of a treatment BMP as the permittees, that this option was the least degrading to the receiving water, and that the acquisition of land is not necessary. The department utilized average construction cost data reported from urban grant recipients from 2016 through 2019 to determine the average cost of implementing treatment BMPs (roughly $134,948 per treatment device). When adjusted for inflation as of August 2022, the cost to implement a treatment BMP is approximately $161,246. Since these BMPs are largely used for conventional pollutants (TSS, phosphorous), the program assumed that additional treatment technology (enhanced media filtration) and operation and maintenance costs would be incurred for specialty filtration systems related to metals and other non-conventional pollutants. The storm water program estimated an additional $30,000 of costs for annual operation and maintenance associated with treatment of non-conventional pollutants.

The total annual estimated costs for year one and year two for a permittee seeking coverage under an IP is represented in Table 6.

Table 6 - Annual Estimated Cost Associated with one Permittee Covered Under an Individual Industrial Storm Water Permit

Costs	Dollars ($) Year One	Dollars ($) Year Two
Individual Permit Application Fee	500	
Data Collection to determine background concentration*	8,400	
Modeling, Analysis, and Engineering Costs (Lump Sum)	20,000	
Documentation for Alternatives	15,000	
Average Cost to Implement a Structural BMP (Adjusted for Inflation)	161,246	
Annual Operation and Maintenance Costs for Specialty Filtration	30,000	30,000
Total	**$235,146**	**$30,000**

*Based on costs associated with Table 1.

Thus, the total costs associated with two facilities over a two-year period (a discharge to a high quality water listed by type and a discharge to other high quality water) is $530,292.

Industrial Stormwater, Increased Discharge

In SFYs 2021 and 2022, department staff estimated that an average of 0.07% and 0.14%, respectively, of permitted industrial facilities requested an amendment that could be considered an increased discharge. The spatial analysis results shown in Table 4 indicate 145 industrial facilities are located within one-quarter mile of a high quality water listed by type in the proposed rule language. The storm water program is proposing to draft permit conditions that continue to cover most facilities that seek an amendment under the general storm water permit, therefore, no additional costs would be incurred for facilities that qualify.

However, if a conservative percentage of 1% of amendment requests were applied to the 145 industrial facilities located within one-quarter mile of waters proposed to be defined as high quality water in the proposed rule language, 1.45 industrial facilities (rounded to two), would be affected every two years. The department assumes, for the purpose of this analysis, that similar costs would be incurred by an industrial facility that had a new discharge and was unable to meet the conditions of the general permit. In this scenario, the same assumptions represented in a new industrial storm water discharge were applied to industrial permittees with an increased discharge.

The total annual estimated costs for year one and year two for a permittee seeking coverage under an IP is represented in Table 6. However, since two facilities would be affected every two years, the total estimated costs associated with permit coverage under an IP is represented in Table 7.

Table 7 - Two-Year Estimated Costs Associated with Two Permittees Covered Under an Individual Industrial Storm Water Permit

	Per Permittee	Total Statewide Cost (2 Permittees)
Year 1 Cost	$235,146	$470,292
Year 2 Cost (Operation and Maintenance)	$30,000	$60,000
Total	**$265,146**	**$530,292**

Summary of Storm Water Costs

The maximum annual estimated cost associated with the proposed rule includes:

- The estimated construction annual permittee costs associated with a proposed pollutant reduction to MEP as shown in Table 5 ($900).
- The annual estimated cost associated with one permittee every two years covered under an individual industrial storm water permit that would be considered a new discharge to a high quality water listed by type shown in Table 6 ($265,146).
- Costs associated with coverage under one individual permit for other high quality waters ($265,146).
- The annual estimated cost associated with two permittees covered under an individual industrial storm water permit that would be considered an increased discharge Table 7 ($530,292), assuming that both facilities would be affected in a single year.

The maximum two-year cost associated with the proposed rule includes:

- The estimated construction annual permittee costs associated with an MEP claim shown in Table 5 ($900 per year for two years, for a total of $1,800).
- The annual estimated cost associated with one permittee covered under an individual industrial storm water permit that would be considered a new discharge to a high quality water listed by type as shown in Table 6 ($265,146) every two years (value includes year two operation and maintenance fees).
- Costs associated with coverage under an individual industrial permit for other high quality waters ($265,146).
- The annual estimated cost associated with two permittees covered under an individual industrial storm water permit that would be considered an increased discharge ($470,292) assuming that both facilities would be affected in a single year, and in year two, an additional $60,000 in operation and maintenance costs for both facilities as shown in Table 7 ($530,292).

Table 8 summarizes the estimated total expected statewide storm water costs from this rule:

Table 8 - Estimated Maximum Annual and Maximum Two-Year Estimated Costs Associated with the Proposed Rule

Program Area	Maximum Annual Dollars ($)	Maximum Two-Year Dollars ($)
Construction, New Discharge	900	1,800
Industrial, New Discharge (High Quality Water Listed by Type)	235,146	265,146
Industrial, New Discharge (Other High Quality Water)	235,146	265,146
Industrial, Increased Discharge	470,292	530,292
Total	**$941,484**	**$1,062,384**

Concentrated Animal Feeding Operation (CAFO) Permittees

There are no anticipated cost impacts for typical CAFO permittees that do not discharge to surface water under alternative discharge limits (ADLs). Typical CAFO permits contain production area discharge limitations that are sufficient to prevent antidegradation of surface waters and, therefore, additional analysis is not necessary.

Antidegradation analysis is currently required for CAFOs seeking an alternative discharge limitation because they treat manure and/or process wastewater and recurringly discharge treated effluent to surface water. CAFO permittees seeking to establish a new discharge to surface water under ADLs may need to assemble a demonstration (submitting a social or economic determination and an alternatives analysis) under the proposed rule, where they did not before, in situations where 10-33% of assimilative capacity will be used[3]. Based on the number of these systems permitted or proposed to be permitted in recent years (9 systems in the last 5 years), the department anticipates that 2-3 CAFO permittees will seek to establish surface water discharges under ADLs in each year. Of those, none discharged or are proposing to discharge to waterbodies in which their discharge would use between 10% and 33% of assimilative capacity. This analysis was performed by comparing BOD5, ammonia, and temperature limits calculated using both 10% and 33% of the assimilative capacity. Metals were also considered, but the department's experience has been that CAFOs discharging would need to add hardness to their effluent to avoid triggering metals limits in their WPDES permits; this is the case regardless of whether an antidegradation demonstration is needed.

Additional review requirements are not expected for CAFOs seeking an ADL for the following pollutant categories, as brought up in comments:

- Because bioaccumulative chemicals are not typically found in agricultural waste, discharges of BCCs to Great Lakes system waters is not expected from CAFOs and would therefore not trigger antidegradation analysis.

[3] Antidegradation requirements already apply to CAFOs seeking an ADL that are proposing to discharge >33% of the assimilative capacity, so those cases would not incur additional costs under this rule. Only those between 10% and 33% would be newly required to conduct an alternatives analysis and social or economic analysis.

- Reverse osmosis and ultrafiltration systems typically used with an ADL are very proficient at removing Total Phosphorus and Total Suspended Solids, which are the two main pollutants of concern from agricultural waste that are being addressed by EPA-approved TMDLs. Therefore, antidegradation analysis due to new or increased discharge of Total Phosphorus or Total Suspended Solids allocated under an EPA-approved TMDL is not expected.

Obtaining an alternative discharge limitation to discharge to surface waters would be an alternative to the baseline technology requirement of storing and land applying raw manure and process wastewater. Additional costs associated with determining other alternatives beyond the advanced treatment already proposed for an ADL is not anticipated. Therefore, if antidegradation analysis was required for a CAFO seeking an alternative discharge limitation, then the department would not require the permittee to consider a different alternative given that the ADL is already a less-degrading alternative.

Again, the department does not believe antidegradation analysis would be triggered for any CAFOs under the proposed rule, and therefore additional costs for alternatives analyses or social or economic analyses are not included.

The department expects that no CAFOs discharging to surface water would need to install more stringent treatment as a result of an alternatives analysis, as treatment systems proposed to date for these permittees have been advanced systems, typically including reverse osmosis. The department did receive a comment regarding costs associated with project delays, and has determined that these costs are not easily quantifiable due to the complexities in predicting those scenarios.

Local Governmental Units Costs

All costs to POTWs that are municipally owned are estimated in this section. Of all wastewater (i.e. non-CAFO and non-stormwater) WPDES permittees in the state, approximately 75% are POTWs, which are municipally owned. To estimate the costs to local governmental units, the department assumed that 8 of the 10 facilities incurring additional costs for the alternatives analysis, and 16 of the 20 facilities incurring additional sampling costs each year, were POTWs. As stated previously, one permittee per year anticipated to choose an alternative is assumed to be a POTW. These costs are summarized in Table 9 below.

Table 9 – Annual Cost Summary for Local Governmental Units

Cost Area	Low End Number of POTWs Per Year	High End Number of POTWs Per Year	Low End Cost Per Facility	High End Cost Per Facility	Low End Total Statewide Annual Costs to POTWs	High End Total Statewide Annual Costs to POTWs
Alternatives Analysis	4	8	$35,000	$50,000	$140,000	$400,000
Sampling	8	16	$1,400	$8,400	$11,200	$134,400
Choosing an Alternative	1	1	$4,784	$11,960	$4,784*	$59,800*
				Total:	**$155,984**	**$594,200**

*The cost to implement a chosen alternative is an ongoing annual cost that is incurred by one new additional permittee each year for up to five years.

Public Utility Rate Payers Costs

The expected increase in annual sewer rates for the four to eight identified municipalities that may both perform sampling of the receiving waterbody and develop an alternatives analysis is $3.94/person/year up to $6.33/person/year for one year. This was derived by dividing the estimated cost range per affected POTW ($36,400- $58,400) by the average population of a municipality in Wisconsin (5,900,000 Wisconsinites/639 facilities = 9,233 Wisconsinites/municipality).

Four to eight POTWs will not incur the cost to develop an alternatives analysis and will only incur water quality sampling costs, so the expected increase in annual sewer rates for individuals within these communities is $0.15/person/year up to $0.91/person/year.

Since the chosen alternative compliance option relies on continued implementation of source reduction measures, the one POTW assumed to implement these actions will incur these additional costs for up to five years after the first permit term, but will only incur the costs related to the alternatives analysis and sampling for one year. The individuals within these communities may experience an increase in their rates in the range of $4.46/person/year up to $7.62/person/year for one year, with the rate increase lessened to $0.52/person/year up to $1.29/person/year thereafter for 4 more years.

Small Business Costs

For the purposes of this economic impact analysis, the department is making the conservative assumption that all affected industrial facilities (both wastewater permittees and stormwater permittees) are small businesses due to the anticipated low number of economically affected industrial facilities statewide overall. This should not be construed to imply that large industrial facilities will not be economically affected by this rule, rather, the economic impact of this proposed rule has accounted for these facilities in the event they would be considered a small business. This analysis does not separate these small businesses by sector since the rule will apply to all sectors equally.

Table 10 - Cost Summary for Industries (assumed to be small businesses)

Cost Area	Low End Number of Small Businesses Per Year	High End Number of Small Businesses Per Year	Low End Cost Per Small Business	High End Cost Per Small Business	Low End Total Statewide Annual Costs to Small Businesses	High End Total Statewide Annual Costs to Small Businesses
Alternatives Analysis (Wastewater Permittees)	1	2	$35,000	$50,000	$35,000	$100,000
Sampling (Wastewater Permittees)	1	2	$1,400	$8,400	$1,400	$16,800
Construction, New Discharger (Stormwater Permittees)	0	1	$0	$900	$0	$900
Industrial, New Discharger to High Quality Water Listed by Type (Stormwater Permittees)	0	1	$0	$235,146	$0	$235,146
Industrial, New Discharger to Other High Quality Water (Stormwater Permittees)	0	1	$0	$235,146	$0	$235,146
Industrial, Increased Discharge (Stormwater Permittees)	0	2	$0	$235,146	$0	$470,292
				Total:	**$36,400**	**$1,058,284**

Total Costs

The tables provided below summarize the total expected statewide costs from this rule.

Table 11 – Total Annual and 2-Year Cost Summary for Rule

Type of Facility	Maximum Annual Cost	Maximum 2-Year Cost
Wastewater	$711,000*	$1,422,000*
Stormwater	$941,484	$1,062,384
CAFO	$0	$0
Total:	**$1,652,484**	**$2,484,384**

*These Wastewater costs are derived from the "High End" numbers for wastewater facilities identified in Tables 9 and 10 above. Additionally, these costs assume a period of five years where facilities that choose an alternative option are incurring those additional implementation costs ($500,000 + $151,200 + 5x $11,960 for the maximum annual cost, and 2x ($500,000 + $151,200 + 5x $11,960) for the maximum 2-year cost).

Table 12 – Total 10-year Cost Summary for the Rule

Cost Area	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Alternatives Analysis (Wastewater Permittees)	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000
Sampling (Wastewater Permittees)	$151,200	$151,200	$151,200	$151,200	$151,200	$151,200	$151,200	$151,200	$151,200	$151,200
Choosing an Alternative (Wastewater Permittees)	$11,960	$23,920	$35,880	$47,840	$59,800	$59,800	$59,800	$59,800	$59,800	$59,800
Construction, New Discharger (Stormwater Permittees)	$900	$900	$900	$900	$900	$900	$900	$900	$900	$900
Industrial, New Discharger High Quality Water Listed by Type (Stormwater Permittees)	$235,146	$30,000	$235,146	$30,000	$235,146	$30,000	$235,146	$30,000	$235,146	$30,000
Industrial, New Discharger Other High Quality Water (Stormwater Permittees)	$235,146	$30,000	$235,146	$30,000	$235,146	$30,000	$235,146	$30,000	$235,146	$30,000
Industrial, Increased Discharge (Stormwater Permittees)	$470,292	$60,000	$470,292	$60,000	$470,292	$60,000	$470,292	$60,000	$470,292	$60,000
Total:	**$1,604,644**	**$796,020**	**$1,628,564**	**$819,940**	**$1,652,484**	**$831,900**	**$1,652,484**	**$831,900**	**$1,652,484**	**$831,900**
10-Year Cumulative Total: $12,302,320										

Expected Benefits Associated with the Proposed Rule

The purpose of this section is to provide Wisconsin residents information on the potential economic benefit in aligning Wisconsin's approach to antidegradation in surface waters with that at the federal level. Due to the significant number of unknowns associated with conducting this type of analysis, the estimated economic benefits have not been factored into this economic impact analysis, and the information contained in this section is informational only.

Lowering the threshold at which a facility would need to perform an alternatives analysis would presumably increase the amount of antidegradation reviews performed statewide. One anticipated consequence of performing more antidegradation reviews is better maintenance of water quality in Wisconsin's surface waters that are attaining standards and prevention of future degradation. To quantify this, the department looked at instances where recreational economic benefits of water quality attaining standards were quantified.

Researchers at the University of Delaware quantified direct use benefits in the Delaware River Basin to range from $371 million up to $1.1 billion per year as a result of increasing their dissolved oxygen standard from 3.5 to 5.0 mg/L[4]. Though this comparison cannot be directly made to the potential benefits of Wisconsin's antidegradation rule, it shows that improved water quality for just one parameter (in this case, dissolved oxygen concentrations), can cumulatively result in millions of dollars of economic benefit.

For Wisconsin-specific data, researchers at the University of Wisconsin-Eau Claire estimated property value gains associated with water clarity on 20 lakes in Northern Wisconsin[5]. This study showed that the most significant property value gains would be realized in lakes with currently low water clarity (9-16% increase) if the water clarity were to improve. This study estimated that the economic value of the lake to the average property was roughly $64,400, with this value increasing to $90,400 if clarity of the lakes increased by 3 feet.

Not only do high-quality waterbodies tend to have higher real estate values and thus contribute more to the tax base, but it also costs less to protect them than to restore polluted water. Wisconsin's high-quality surface waters generate significant recreational and economic interest; anglers and waterfowl hunters spend $1.5 billion annually in Wisconsin. Wisconsin's outdoor recreation Gross Domestic Product (GDP) growth has increased almost twice as fast as the total GDP growth rate[6].

The department is not claiming that the proposed rule will directly result in the above economic benefits. However, the department has included this information as an acknowledgment that there are economic benefits associated with improving water quality in Wisconsin, along with preventing degradation of existing surface water quality.

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[4] Kauffman, Gerald J. "Economic benefits of improved water quality in the Delaware River (USA)." River Research and Applications 35.10 (2019): 1652-1665.

[5] Kemp, Thomas, Irene Ng, and Haikal Mohommad. "The impact of water clarity on home value in Northern Wisconsin." Appraisal Journal 85.4 (2017): 285-306.

[6] Headwaters Economics. (2020). Outdoor recreation: A Top Driver of Wisconsin's Economy. https://www.industry.travelwisconsin.com/outdoor-rec-office/