

**State of Wisconsin
Department of Natural Resources**

**Responses to Comments
Municipal Phosphorus Reduction Credit for Leaf Management Programs**

February 2022

On February 10, 2021, the Wisconsin Department of Natural Resources (Department) issued a public notice on a proposed update to “Interim Municipal Phosphorus Reduction Credit for Leaf Management Programs”. The purpose of this interim guidance is to allow Municipal Separate Storm Sewer (MS4) permittees with Total Maximum Daily Load (TMDL) phosphorus limits to include reductions to total phosphorus in urban stormwater from a specific leaf management program. The purpose of this update is to incorporate the results of additional studies and address common implementation issues. The Department received comments on the proposed guidance from the following organizations:

Organization	Commenter Number [C-#]
Bill Carlin, Green Bay Resident	1
City of Brookfield	2
City of Madison	3
City of Watertown	4
League of Wisconsin Municipalities	5

This document represents the Department’s response to the written comments on the guidance. To facilitate the responses, the Department may have paraphrased, rephrased, condensed, or consolidated comments. Thank you to all for taking the time to review and comment on the proposed guidance.

PUBLIC COMMENTS

Comment 1: Why is there a requirement for leaves to be placed on the terrace rather than in the curbing? The supporting study done by the USGS (2020-5109) would seem to indicate that there is little difference between leaf PILED on the terrace vs in the curb:

From page 13: Phosphorus and nitrogen from leaf piles placed in the terrace versus the street are less of a concern to the overall increase of nutrients in urban runoff.

Piling leaves on the terrace damages the grass, especially if the city does not pick them up for several weeks, which is usually the case. They also damage the grass while trying to remove the leaves from the terrace and leave a great deal of them behind, which provides further chance for toxic run-off. The process slows the rate of leaf collection and reduces the frequency of pickups as a result. The whole process appears to be self-defeating. [C-1]

Response: The cited sentence from the research report is intended to convey that leaves on the terrace are less likely to contribute phosphorus to urban runoff than leaves in the street and curb line. This is clarified in the remainder of the paragraph from which the above statement was excerpted. The City of Green Bay Department of Public Works posts information on leaf collection timing on their Facebook page to assist residents in minimizing the amount of time leaf piles are placed in the terrace. Studies have clearly demonstrated that dissolved phosphorus in urban storm water increases with increased leaves in the curb line.

Comment 2: The report also states the largest contributor to toxic run-off is leaf litter spread across the pavement (vs piled in the curb). The leaf collection in Green Bay utilizes tractors that push the leaf piles for hundreds of yards into a central collection pile where it is picked up by end-loaders and dump trucks. This has the undesired consequences of scattering the leaf litter across entire lengths of city streets and reducing the amount of leaf debris that is actually collected. The street sweepers that follow this mess do not pick up all of the debris as there are brown "trails" that are 15 feet wide and blocks long, leaving more debris in the roadway than what they pick up. The residents track this leaf debris into our driveways and garages (and eventually our houses), but it also increases the amount of toxic run-off. [C-1]

Response: Leaf litter on the pavement and in the curb line both contribute to phosphorus in the urban storm water. Generally, as vehicles drive on streets the debris is blown toward the curb line where the water flows during rain events. Department staff living in the City of Green Bay have observed the leaf collection efforts in medium density residential areas and have observed that in many neighborhoods there is a significant amount of leaves falling into the street and the collection and street cleaning operations are effective in removing the majority of the material. The brown trails noted are usually debris from baling leaves for more efficient transport offsite. An additional pass with the street cleaner is recommended where this is observed.

Comment 3: I've spoken with Steve Grenier of GBPW dept., and he has indicated that they do not have adequate resources to pick up the leaves as often as they would like to. Until they are able to get more equipment and personnel to pick up more frequently, reducing the amount of time needed for pickup would help improve the situation by allowing residents to pile the leaves in the street and reduce the amount of time spent pushing them around into larger piles. This would also improve the intended outcome of reducing toxic run-off over and above the current method of leaf pick up. [C-1]

Response: The intent of the ban is to prevent the raking or dumping of leaves into the street in addition to the leaves that naturally fall onto the street. The reason for this requirement is to minimize the volume of leaves in contact with water in the gutter and maximize the efficiency of street cleaning operations. Raking leaves from lawns into streets also increases the risk of street flooding due to inlets clogged with leaves, which can be a safety hazard.

Comment 4:

Would the DNR consider removing the requirement for leaves being placed on the terrace for cities to receive the credit for phosphorus reduction? [C-1]

Response: The requirement for leaves to be placed on the terrace rather than in the curb line cannot be removed because the leaves in the curb line are a significant source of phosphorus in urban storm water discharges during the fall season. Residents that rake leaves from their yards into the curb line increase the amount of phosphorus available to leach into storm water. Keeping the leaves out of the curb line also reduces the potential for inlet clogging due to leaves.

Comment 5: Municipalities with medium density or less residential land use without alleys should be considered as meeting Criteria 1: Land use: Medium Density (2-6 units/acre) Residential (Single-family) land use without alleys. Medium Density Residential with alleys land use may be included if the alleys receive the same level of leaf collection and street cleaning as the streets,". [C-2]

Response: The department, in consultation with USGS research staff, has decided to revise the land use requirement to include all residential land uses.

Comment 6: Municipalities with non-curbed streets (or roll face curb and gutter streets) that do not accumulate leaves in the streets, should be considered as being at least as effective at reducing phosphorous loadings from streets as those with curb and gutter streets that sweep and remove leaves from the street in accordance with the guidance. Since leaves don't collect on the aforementioned streets, they actually do a better job of "removing" the phosphorous source than those with curb and gutter streets and a collection program. [C-2]

Response: Most streets without curb and gutter have vegetated swale drainage systems. The department already allows municipalities to take credit for pollutant removal for water that infiltrates in those systems. Therefore these municipalities are less likely to need leaf management credit. There is also anecdotal information that residents sometimes rake leaves into swales, which would be counterproductive. Street cleaning, which is a critical element of leaf management for phosphorus credit, is much more effective for curbed streets than non-curbed streets, so the leaf management credit may not be taken for drainage areas that do not have curb and gutter drainage. The reduction credits are meant to allow credit for removing phosphorus that would otherwise discharge and are not intended for situation where the discharge would not occur in the first place.

Comment 7: Municipalities who have a policy indicating residents may collect and dispose of their leaves in their yard (mulch or compost them) or haul them to a yard waste facility and no leaves are allowed to be piled in the street at all should be considered as meeting the municipal policy criteria also [C-2]

Response: While it is acceptable to allow residents to mulch or compost their leaves onsite or haul them to a yard waste facility if they do not choose to participate in leaf collection, the department is concerned that in the absence of a municipal leaf collection program many residents will place leaves in the street for the street cleaner to pick up. While there may be specific cases where education and enforcement efforts are sufficient to change the default behavior for a time, it is not included in this guidance as it is outside of what was studied and is unlikely to be a reliable method of keeping leaves out of the streets.

Comment 8: Municipalities that have non-curbed streets (or with roll face curb) where leaves do not accumulate in the street are unaffected by parking demand so should be considered as meeting the parking density criteria. Furthermore, municipalities have minimal on-street parking demand if they have a typical driveway length of 50 feet or greater. [C-2]

Response: A parking ordinance would not be required where parking densities are typically light.

Comment 9: We object to the statement in section D. Guidance Content, "At this time, numeric credit for leaf collection is not available for other land uses, lower-density tree canopies, or non-curbed streets." We believe it is logical and supported by scientific principles that a numeric credit for leaf collection should be considered as met for non-curbed streets as discussed above. In fact, one could argue that not having leaves accumulate on the street with non-curbed streets is more effective and should get greater credit than that which is identified in the guidance. [C-2]

Response: Please see the response to Comment 6.

Comment 10: We believe that the limited applicability of this guidance to only "medium density residential" land use is not justified. In our opinion, the limiting criterion should be percent tree canopy over the street pavement or the right-of-way. If the minimum canopy cover were met, then the phosphorus

loading (and leaf removal benefits) would be the same as what was measured in the USGS studies. The unit phosphorus loadings as applied in WinSLAMM are the same for vegetated source areas for all residential land use categories. Since WinSLAMM does not differentiate the unit phosphorus loadings, the resulting benefits of fall leaf removal are not impacted. Further, it is not practical for municipalities to alter their leaf removal programs based on WinSLAMM residential densities (low, medium, high).

Please extend the applicability of the Interim Municipal Phosphorus Reduction Credit for Leaf Management Programs to urban areas that meet the WinSLAMM definition of low-, medium-, or high- density residential, as long as the other conditions of “Section D Guidance Content” are met. [C-3,5]

Response: The department will modify the guidance to replace ‘medium density residential land use’ with ‘residential land use’.

Comment 11: Please remove the sentence “The reduction in total phosphorus may vary with the type of street cleaner so for this credit, only regenerative air street cleaners may be used at this time”. This sentence is misleading and seems to imply that credit is only allowed if municipalities use regenerative air for street cleaning after terrace leaf removal. Table 1 (and elsewhere in the Guidance) notes that mechanical broom sweepers are allowed for a total phosphorus credit. [C-3, 5]

Response: For the weekly sweeping option, there is a limitation on use of the higher credit to only regenerative air street cleaners because that is what has been quantified to date. There is an ongoing study to determine what phosphorus reduction can be obtained by using mechanical broom sweepers weekly. The lower credit option allows both types of sweepers.

Comment 12: We disagree with the assumption that other BMPs would automatically be duplicative of leaf management over the same drainage area. We request this sentence be revised to provide that a municipality can take credits for other BMPs in the same drainage area if it can and that a municipality can claim and utilize credits from other BMPs in the same drainage area if it can be demonstrated that the combination of BMPs is not duplicative of credits generated by a leaf management program.. [C-3,5]

Response: The department is currently sponsoring a study to evaluate the performance of leaf collection in series with a wet pond. If the study shows that the pollution reduction is not duplicative, then the department will revisit this policy.

Comment 13: Second paragraph, 3a: The criteria of using “...average of one or more mature medium to large canopy trees . . .” is ambiguous. An objective definition of what is meant by “medium to large canopy” would help reduce the uncertainty of this criterion. [C-3,5]

Response: The intent of including this as a quantification option is to allow municipalities that have limited GIS capabilities to assess if they have sufficient canopy cover over the street. The Arbor Day Foundation defines a medium size tree as having a height of 30 to 70 feet and a large tree has having a height 70 feet or greater (<https://www.arborday.org/trees/rightTreeAndPlace/size.cfm>). For the medium tree, they recommend a minimum spacing from the corner of a 1-story building of 12 feet. Therefore, a medium canopy tree could be assumed to be one with a canopy at least 24 feet in diameter.

Comment 14: The proposed new guidance increases the minimum street canopy cover from 17% to 40% in order to qualify for a phosphorus reduction credit. Does this mean that MS4s who have already calculated total phosphorus (TP) reduction under the March 8, 2018 guidance no longer qualify for the TP reduction

if the street canopy cover was less than 40%? The guidance should state this result and clarify how MS4s who have already conducted the analysis are to proceed. [C-3, 5]

Response: A municipality that used the average of one or more medium to large canopy trees per 80 feet of curblineline to identify areas that meet the canopy criteria do not need to re-evaluate which areas meet this criteria. Communities that used a GIS method to quantify tree canopy cover should re-assess which areas qualify for the credit.

Comment 15: This guidance should define the word “terrace.” [C-3, 5]

Response: A definition of terrace will be added to the guidance. In Wisconsin, terrace is used for the area between the sidewalk and the curb line. In Buffalo, NY, the term ‘snow storage’ is used instead of terrace.

Comment 16: Table 1: We suggest adding a footnote to reference the column “Applicable annual TP % Reduction” to read: “Reduction from a “no controls” condition as modeled in accordance with DNR guidance.” [C-3, 5]

Response: The note will be added.

Comment 17: The department should remove language under Table 1 providing: “For municipalities located in northern Wisconsin, an earlier start for leaf management activities should be considered.” This language is vague (what constitutes “northern Wisconsin”?) and should be revised to clarify that credits are available as long as street cleaning activities are commenced by the date indicated in Table 1 or municipalities use street leaf conditions, as documented in photos, as the determination of when to begin leaf management. Deference shall be given to photo evidence determining the commencement of the municipal leaf management activity to generate credits. [C-3, 5]

Response: The cited sentence has been deleted, as Table 2 communicates the idea more clearly.

Comment 18: The City of Watertown designates Two-Family Residential-6 zoning separate from Single-Family Residential-4 land uses. Both zoning areas meet the 2-6 units/acre requirement listed in the Land Use condition under D. Guidance Content on Page 5 of the DRAFT guidance document. The Two-Family Residential-6 zoning category includes structures such as side-by-side duplexes, older previously single-family homes that have been converted into 2-family flats (vertical units as opposed to side-by-side or horizontal units), or Twin Homes (not allowed in Single-Family Residential – 4. The land use and historical development patterns for the Two-Family Residential-6 area is very similar to that of the Single-Family Residential-4 area.

The streets, curb and gutter/storm system, and tree locations do not typically differ between the City’s Single-Family Residential-4 and Two-Family Residential-6 zoning areas, and therefore would not impact the type of leaf collection and street cleaning procedures conducted between the two different land uses. A drive through these areas will show neighborhood blocks with older homes, which were originally built 80 or more years ago for larger families. Many of these homes are not practical or economical for today’s family sizes to occupy alone and are split into 2 units. [C-4]

Response: As noted in the response to comment 10, the department is modifying the guidance to allow credit to be taken for any residential land use that meets the other criteria.

Comment 19: An alternative to creating a new ordinance to regulate parking on side streets that is limited to only a couple months of the year, a policy could be developed and shared with residents through the existing stormwater education and outreach program explaining the need for varying parking restrictions during the fall. The City utilizes a “Temporary-No Parking” system for community events, snow removal, construction activities, and more. This same system could be implemented for leaf collection and street cleaning activities. This option would be more flexible, as it could be implemented as needed depending on the start of leaf-drop each year and the quadrant of the City to be worked in the applicable days. An ordinance would likely be more static, with requirements that would be implemented even in areas the rotating crews would not be working in on a particular day.

The Temporary-No Parking policy could be implemented for multiple days, to account for the collection activities and follow-up street cleaning 24 hours later. This option may allow for more flexibility with scheduling crews and collection activities, as opposed to an ordinance that would most likely require defined and structured timeframes. [C-4]

Response: The document will be revised to require either an ordinance or an enforceable policy, such as use of temporary parking restrictions.

Comment 20: The DRAFT Update to the Interim Municipal Phosphorus Reduction Credit for Leaf Management Programs (DRAFT Update 7-22-2020) provides details on the background studies and an acceptable framework for municipalities to count municipal leaf collection programs as a phosphorus control. An additional piece of information that would be very useful in this guidance document would be an explanation of how to quantify or calculate the amount of phosphorus controlled in the acceptable land use areas. Information on acceptable methods, such as computer modeling, spreadsheets, or other calculations, would allow municipalities to estimate the amount of phosphorus that may be controlled under a program that would meet the conditions laid out in this guidance document. This would allow municipalities to compare the cost of improving existing programs to meet the guidance document as compared to the cost of other potential phosphorus controls or best management practices. [C-4]

Response: Attachment 1 has been appended to the guidance showing an example from a conference presentation.

Comment 21: Second paragraph, 2: The guidance only applies to curb and gutter streets with storm sewer drainage systems. The League believes there may be other street scenarios for which the guidance could also be available. For instance, it may be applicable to streets without curbs but that run adjacent to waterbodies. The League requests that this language be revised to provide municipalities with flexibility to demonstrate to the department that despite having curbless streets, this credit should nonetheless be available to them. [C-5]

Response: The studies to date have demonstrated that street cleaning is a critical element needed to reduce phosphorus concentrations in urban storm water. Street cleaning is less effective in areas where there is no curb or other edge to the street. Therefore no credit can be given for leaf management in areas without curb and gutter drainage.

AMENDMENT BY THE DEPARTMENT

The following changes have been made to the Guidance Document in addition to changes made in response to comments noted above:

Document Section	Summary of Change	Reason for Change
A. Introduction	Wording was updated for clarity and to remove the emphasis on Medium Density Residential Land Use	Consistency with other changes made in response to comments, corrections to TMDL terminology.
C. Background and Definitions	3 rd paragraph changed four years to seven years.	Update for passage of time
E. References	Added reference to Selbig, et. al. 2020 publication	Guidance incorporates information from the publication.
Throughout	Replaced leaf collection with leaf management where the reference was to the combination of leaf collection and street cleaning. Replaced 'leaf pickup' with 'leaf collection'	Consistency and clarity

The final guidance was approved on February 17, 2022.

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