

# Response to Public Comments on the Lake Pepin Watershed Phosphorus Total Maximum Daily Load Report

## City of Minneapolis

**Comment 1:** The Report includes this sentence: “The extent of reduction needed to achieve 0.35 lb/acre/year will vary by MS4.” The MPCA should allow for a variety of options to be available for demonstrating compliance with this target loading, including the option of utilizing monitoring data from outfall and stream monitoring from a variety of sources as well as water quality modeling data.

**Response to Comment 1:** The Minnesota Pollution Control Agency (MPCA) agrees that achievement of a target loading rate can be successfully demonstrated using data from monitoring of outfalls and streams, modeling results, or a combination. The MPCA Stormwater Manual provides guidance on this topic. Section 5.2.2 of the total maximum daily load (TMDL) report has been revised to clarify this flexibility.

**Comment 2:** The City of Minneapolis has numerous natural lakes that are meeting water quality standards before ultimately discharging to creeks tributary to the Mississippi River and Lake Pepin. The City should be able to take credit for the water quality of these lakes as they discharge into the City’s MS4 conveyance system rather than evaluating all pipesheds within the city independent of their direct discharge to the Mississippi River.

**Response to Comment 2:** The approach taken by a Municipal Separate Storm Sewer System (MS4) to demonstrate compliance with the wasteload allocation (WLA) is part of the permitting process and is outside the scope of the TMDLs process. The comment was forwarded to the MPCA MS4 program for consideration. The MPCA MS4 program has on-going discussions regarding these matters with MS4 stakeholders; this comment was discussed generally during follow up meetings after public notice and the program provided this response: The total phosphorus (TP) TMDL WLA for MS4s is applied to discharges from the MS4 collection and conveyance system to a Water of the State. Given the large number of MS4s addressed by the Lake Pepin TMDL and the challenges associated with clearly delineating the areas served by each MS4 collection and conveyance system, a relatively simple approach was used to calculate the MS4 WLA. The MS4 WLA was calculated using an allowable loading rate of 0.35 lb/acre/year and multiplying that by the jurisdictional area of each MS4. The entire jurisdictional area was used to calculate the WLA, including areas that may not be served by the MS4 collection and conveyance system, such as undeveloped land and Waters of the State. This approach results in a WLA that is greater than 0.35 lb/acre/year when applying the WLA to the average loading rate across discharges from the area served by the MS4 collection and conveyance system.

This WLA was developed as a reasonable goal for urban stormwater discharges. Data from 2008 MS4 Non-degradation Reports from thirty cities suggest that half of the communities were achieving 0.35 lb/acre/year at that time. Additional data collected by MCES between 2005 and 2014 from six

## Response to Public Comments on the Lake Pepin Watershed Phosphorus TMDL

drainage basins in the Twin Cities Metropolitan Area showed the 10-year average from each basin to be below 0.35 lb/acre/year.

The WLA does not account for natural attenuation of phosphorus in Waters of the State and, therefore, an MS4 will not be allowed to take credit for phosphorus removal facilitated by natural processes in a Water of the State.

An MS4 will have flexibility in the approach taken to demonstrate progress towards compliance with the WLA. Section 5.2.2 of the TMDL report has been revised in response to this comment to clarify the development and application of the MS4 WLA.

**Comment 3:** The City and watershed management organizations have completed significant in-stream improvements to eliminate streambank erosion and limit the amount of sediment and phosphorus mobilized by unstable stream sections. While not directly connected to the City's MS4 conveyance system this work presents a significant opportunity to improve downstream water quality and the City should be allowed to take credit for these projects and their associated reductions in TP when demonstrating compliance with the TMDL.

**Response to Comment 3:** The approach taken by an MS4 to demonstrate compliance with the WLA is part of the permitting process and is outside the scope of the TMDLs process. The comment was forwarded to the MPCA MS4 program for consideration. The MPCA MS4 program has on-going discussions regarding these matters with MS4 stakeholders; this comment was discussed generally during follow up meetings after public notice and the program provided this response: The MPCA acknowledges and commends the efforts made by the City of Minneapolis, other cities, and watershed management districts and organizations to conduct in-stream improvements. However, stream improvements cannot be credited toward achievement of the TMDL MS4 WLA. The WLA applies to discharges from the MS4 collection and conveyance system, as discussed in Response to Comment #2. The TMDL establishes a WLA for MS4s that is a reasonable goal for urban stormwater discharges, as discussed in Response to Comment #2. Activities performed in areas outside the MS4 collection and conveyance system cannot be credited toward achieving the WLA. However, the MPCA is open to discussing trading options with MS4 permittees to meet TMDL WLAs. See Response to Comment #2. The TMDL report has not been revised in response to this comment.

**Comment 4:** The City and the Minneapolis Park and Recreation Board (MPRB) have implemented shoreline stabilization projects to minimize erosion along lakeshores. While this is not a part of the MS4 conveyance system these projects do play a significant role in minimizing the amount of suspended sediment and TP in the downstream receiving waters, including the Mississippi River and Lake Pepin. These projects should count towards the required TMDL load reductions.

**Response to Comment 4:** The approach taken by an MS4 to demonstrate compliance with the WLA is part of the permitting process and is outside the scope of the TMDLs process. The comment was forwarded to the MPCA MS4 program for consideration. The MPCA MS4 program has on-going discussions regarding these matters with MS4 stakeholders; this comment was discussed generally during follow up meetings after public notice and the program provided this response: The MPCA acknowledges and commends the efforts made by the City of Minneapolis, other cities, and watershed management districts and organizations to conduct in-lake improvements. However, shoreline stabilization projects cannot be credited toward achievement of the TMDL MS4 WLA. The

## Response to Public Comments on the Lake Pepin Watershed Phosphorus TMDL

WLA applies to discharges from the MS4 collection and conveyance system, as discussed in Response to Comment #2. The TMDL establishes a WLA for MS4s that is a reasonable goal for urban stormwater discharges, as discussed in Response to Comment #2. Activities performed in areas outside the MS4 collection and conveyance system cannot be credited toward achieving the WLA. See Response to Comment #2. The TMDL report has not been revised in response to this comment.

**Comment 5:** Please provide, as per Minnesota statute, the estimated costs for implementation and compliance for the MS4 permittees in the TMDL drainage area. These cost estimates should address the following costs for MS4 permittees:

- Implementation of BMPs (structural and nonstructural) to reduce phosphorus loads
- Modeling (any type) to estimate P loading
- Reporting and monitoring (Phase I cities) under the MS4 permits – including estimated pollutant load reductions)
- Determining the area served by the stormwater collection and conveyance system

**Response to Comment 5:** We acknowledge that developing a cost estimate for MS4s to attain the WLA is a difficult and complex task. This difficulty is due in large part to a lack of information on the subject, but it is further complicated by (1) not knowing precisely how many MS4s currently meet the WLA (many MS4s are already meeting the WLA), and (2) the interconnectedness of the Lake Pepin phosphorus WLAs with WLAs for other TMDLs (e.g. South Metro Mississippi TSS TMDLs, Minnesota River TSS TMDLs, smaller scale, more local TMDLs). The costs associated with goal attainment for TSS and phosphorus WLAs across different TMDLs at different scales should not be considered or analyzed individually because the majority of best management practices (BMPs) that address sediment reduction will also have positive impacts on phosphorus reduction. As such, the cost section of the TMDLs document was bolstered to include available reference information regarding phosphorus reduction costs for MS4s. This information can be used generally to help understand potential costs to an individual MS4 that needs to pursue reductions. In MPCA's efforts to find information to use in such a task, MCSC has also acknowledged the dearth of good information on the costs of stormwater investments and permit compliance.

The Lake Pepin TMDL includes 205 MS4s and 11 likely future MS4s covering approximately 1.6 million acres and serving a population of approximately 3,160,000. The allowable phosphorus WLA is based on a loading rate of 0.35 lb/acre/year, resulting in roughly 555,060 lbs of phosphorus. An estimate of the existing phosphorus load from these MS4s was not developed as it is a complicated task for this many MS4s. However, data from 2008 MS4 Nondegradation Reports from 30 cities suggests that 56% of the communities were achieving 0.35 lb/acre/year at that time. Additional data collected by MCES between 2005 and 2014 from six drainage basins in the Twin Cities Metropolitan Area showed the 10-year average from each basin to be below 0.35 lb/acre/year.

Each MS4 exceeding the TMDL WLA will implement a variety of measures to reduce phosphorus loads. Multiple sources were identified that provided some form of costs for reducing phosphorus from stormwater. The costs associated with each measure can vary dramatically as shown in the table below. Therefore, an MS4 will want to optimize a program of BMPs to attain the WLA in the most cost-effective way.

Response to Public Comments on the Lake Pepin Watershed Phosphorus TMDL

BMP	Life cycle \$/lb TP removed	
	Low	High
Wet detention pond	\$ 91	\$ 1,091
Dry detention pond	\$ 682	\$ 3,182
LID - bioretention	\$ 455	\$ 18,182
Average BMP cost	\$ 409	\$ 7,485

The cost for achieving the WLA for a given MS4 will depend on the extent the existing loading exceeds the WLA and the types of BMPs that will result in the most cost-effective attainment of the WLA. The cost for achieving the WLA will be spread out over time and across the MS4 community, including residential, commercial, and industrial land uses.

Based on the 2008 Nondegradation Report, we may assume 44% of MS4s are not meeting the WLA of 0.35 lb/acre/yr, and those exceeding average 0.49 lb/acre/yr TP in their discharge, requiring a reduction of 0.14 lb/acre/yr to meet the WLA. The total pounds of phosphorus needing to be reduced will depend on the area of the MS4. Achieving this level of reduction does not need to be accomplished in a single year, but rather over a number of years. If MS4s have made progress in reducing phosphorus loads from their discharges since 2008, which is likely the case, the cost to meet the MS4 WLA is reduced proportionately by the progress already made.

The MPCA Stormwater Program is working with the Minnesota Cities Stormwater Coalition (MCSC) to develop base loading scenarios which permittees can use to predict pollutant loads and load reductions associated with implementation of BMPs. This will be coupled with appropriate training and guidance developed by the MPCA. This should greatly reduce or eliminate costs associated with calculating pollutant loads and load reductions. For permittees who wish to not use these tools, guidance in the Minnesota Stormwater Manual provides information for typical costs associated with modeling.

Because the Lake Pepin TMDL will be approved after the next reissuance of the MS4 permit, there are no MS4 permit related regulatory obligations, including reporting requirements during the upcoming MS4 permit cycle.

The cost discussion in the TMDL report has been revised in response to this comment to include available reference information regarding phosphorus reduction costs for MS4s.

**Comment 6:** Please provide information and clarification of the role of the 2008 Nondegradation Reports in the context of this TMDL. The 30 Phase II cities chosen to submit Nondegradation Reports are not representative of the urban environment within the City of Minneapolis, where much of the urbanization and development happened long before the implementation of water quality practices and stormwater management. Please explain how these reports are representative of the conditions within fully developed urban areas.

**Response to Comment 6:** The 2008 Nondegradation Reports were one of multiple sources of information used to characterize phosphorus loading rates from MS4s and establish a reasonably attainable WLA of 0.35 lb/acre/year for MS4s. The nondegradation analysis included estimated loading before and after implementation of BMPs. The pre-implementation estimates are therefore

applicable to fully built out scenarios where BMPs have not been implemented. The TMDL report has not been revised in response to this comment.

### **Coalition of Greater Minnesota Cities**

**Comment 7:** TMDL Process Failed to Provide Adequate Opportunity to Comment. Most of our member cities already have phosphorus limits in their wastewater permits based on the draft Lake Pepin TMDL phosphorus waste load allocation. It is our understanding that the draft Lake Pepin TP waste load allocation used to impose limits on multiple CGMC members and many other cities will not change as a result of this TMDL process.

As we expressed during the pre-comment period, we are concerned that MPCA imposed final water quality based effluent limits on our cities based on the draft TMDL waste load allocation through watershed scale pre-TMDL phosphorus effluent limit reviews prior to completing the TMDL process. This was done without providing formal notice and opportunity to comment as required the federal Clean Water Act and the state Clean Water Legacy Act. Putting those limits in place before the TMDL process was complete infringes on cities' legal rights and their ability review and comment on costly regulations that impact them.

Although the response to our pre-comment was that the TMDL process is not the forum to raise these concerns, we disagree. We believe it is necessary to find ways to better integrate the wastewater permitting process within the larger watershed framework, including the TMDL process, and that such a process should be formalized.

**Response to Comment 7:** If a discharge contains a pollutant at a level that causes or has a reasonable potential to cause or contribute to an excursion above a state water quality standard, the MPCA has an obligation under the NPDES program to issue discharge permits containing water quality based effluent limits (WQBELs) for the pollutant (40 CFR §122.44 (d)). Therefore, MPCA is, at times, required to develop and implement WQBELs in advance of anticipated TMDLs. WQBELs in NPDES permits are required to be public noticed. As such, permittees have ample opportunity to comment. The progress made by wastewater discharge permittees to reduce phosphorus loads in the watershed has been significant and is greatly appreciated. Had MPCA waited for U.S. Environmental Protection Agency (EPA) approval of the Pepin TMDL to implement phosphorus WQBELs in the watershed, some portion of the 70% reduction already achieved by wastewater sources would not yet have happened. Less progress would have been achieved toward meeting water quality standards and the costs for reduction would be in the future instead of in the past. Figures 19 through 23 in the TMDL report illustrate the tremendous progress that has been made by wastewater point source dischargers in the Lake Pepin watershed. The TMDL report has not been revised in response to this comment.

**Comment 8:** Under Minnesota law, a TMDL must include a list of potential implementation options and a range of cost estimates. For point sources, it must include the individual data and the estimated cost of compliance addressed by the TMDL. The cost estimate associated with implementation options in this report fails to meet the spirit as well as the requirements of the statute.

Making cost estimates is challenging, but the information serves several important purposes. It allows affected parties, concerned citizens, and policy makers to understand how much it will cost to achieve

## Response to Public Comments on the Lake Pepin Watershed Phosphorus TMDL

the TMDL and to plan accordingly. Equally important, cost analysis informs decisions on the range of implementation options. Given the high cost of implementing a TMDL of this magnitude, the cost estimate should provide more in-depth information and the results of the estimate should factor into waste load allocation and the implementation plan.

Perhaps the most visible item missing from the cost analysis is the impact to MS4 permit holders. Neither the TMDL report nor the Lake Pepin Full Accounting Project appear to mention the cost of stormwater improvements for permit holders.

The cost to wastewater facilities is mentioned, but the report also falls far short on this aspect. The total cost for implementation is not mentioned and both pond systems and industrial permit holders are excluded from the calculation. There is a range of costs per capita per phosphorus removal, but this number was calculated by spreading the total cost to the millions of people within the Lake Pepin TMDL basin. This broad stroke may not adequately capture the costs for smaller communities that must upgrade their facilities, which according to the report could range widely with declining effluent concentration targets.

Failing to perform more than a cursory cost analysis could significantly increase the cost of compliance for the TMDL and results in compliance delays. The cost to reduce phosphorus varies widely depending on the method and responsible party. Variability and cost effectiveness should be considered when determining load allocations. In fact, such an approach appears to be used under the TARGET approach for selecting BMPs (“The TARGET feature takes into account the effectiveness and cost of selected BMPs to provide the most cost-effective (i.e. cost-optimized) plan for achieving the user-defined water quality target”), but such considerations do not appear to play a role in determining waste load allocations for wastewater facilities, or presumably with respect to stormwater permits.

As a result, this TMDL could dictate waste load allocations and implementation that are far more expensive than necessary to achieve the goals of the TMDL.

Ultimately, the cost estimate component of the TMDL process should occur before cities are required to comply with permit limits based on the TMDL. This allows for the regulated community and the public to understand how MPCA’s decisions impact state and local resources and allows for critical oversight of MPCA’s value judgments and implication of state and local resources.

As noted above, MPCA’s process prevented this information from being provided to the regulated community and public before cities were required to make investments to meet the regulations, which further frustrated the spirit and intent of the Clean Water Legacy Act.

MPCA’s should complete a new costs analysis that incorporates all the investments already made and all future costs that will result from implementing the TMDL.

**Response to Comment 8:** Please see Response to Comment #5 for discussion of MS4 costs.

The MPCA has prepared an estimate of municipal wastewater facility costs associated with attainment of the Lake Pepin TMDL WLAs for TP. The estimated costs are summarized in a memorandum titled “Lake Pepin TMDL WWTP phosphorus reduction cost estimates,” dated December 21, 2020. The memorandum is included as Attachment A to this Response to Comments document. The cost of compliance for wastewater facilities is a function of each permittee's actual

Response to Public Comments on the Lake Pepin Watershed Phosphorus TMDL

expenditure, if any, to reduce its phosphorus discharge from current levels to levels that comply with permit effluent limits and/or TMDL WLAs. MPCA’s cost estimates do not ultimately influence actual implementation expenditures. Costs are determined by local decisions with respect to facility staffing and operations as well as the selection, design, construction, and financing of equipment needed to comply with permit requirements. Variability and cost effectiveness are in fact built into the categorical approach for determining wastewater WLAs. See Section 5.2.1 of the TMDL report, particularly Tables 19 and 20. A rough estimate suggests that approximately 320,585 lbs/yr of phosphorus have been removed from WWTP permitted discharges between 2009 through 2011 and 2017 through 2019. The total cost to achieve this reduction has not been tabulated. However, cost per pound of phosphorus removal has been estimated to range between \$7 to \$11 to achieve 1 mg/L TP, \$39-\$175 to achieve 0.8 mg/L TP, and \$91 to \$344 to achieve 0.1 mg/L TP (The Minnesota Nutrient Reduction Strategy, Section 5.6.1).

The TMDL report has been revised to include additional cost information.

**Comment 9:** Based on our review of the draft TMDL and the water quality data presented in the table below, it is clear that Lake Pepin is no longer impaired. The Lake Pepin site-specific water quality standard is 100 micrograms per liter (“ug/L”) for TP and 28 ug/L for algae, which is represented as “chl-a.” Compliance with the standard is assessed using the most recent 10 years of data and an exceedance of both the TP and algal criteria are required to demonstrate an impairment.

Table 9. Summary of water quality data for Lake Pepin. Data represent whole lake averages.

Listed Waterbody Name	Reach (AUID)	TP Standard (ug/L)	Average TP (ug/L)	Chl-a Standard (ug/L)	Average Chl-a (ug/L)	# Samples	Data Source
Lake Pepin	25-0001-00	100	134	28	27	74	LTRMP annual means 2009-2019

(P.23 of the TMDL)

We recognize that the TP criteria, while approaching attainment, is exceeded; however, the lake clearly meets the chl-a criteria. As a result, Lake Pepin is not presently impaired based on state regulations, the adopted site-specific standard or applicable assessment guidance. We request that MPCA withdraw and/or revise the draft TMDL to indicate that Lake Pepin is not impaired and initiate the process to remove the lake from the state’s impaired waters list. Further, we request that MPCA update the Lake Pepin TP waste load allocation and related individual waste load allocations assigned to point sources to account for the additional assimilative capacity for TP in the lake.

We have the following questions for MPCA related to Lake Pepin’s impairment classification and the TMDL waste load allocation:

- MPCA has asserted that Lake Pepin is near compliance but is still impaired. What factual basis does MPCA have to assert that Lake Pepin is impaired?
- Does any existing water quality data or other relevant scientific information indicate use impairment in Lake Pepin?
- Does any existing water quality data or other relevant scientific information indicate Lake Pepin has additional assimilative capacity for TP?

## Response to Public Comments on the Lake Pepin Watershed Phosphorus TMDL

- Can the proposed TP waste load allocation be adjusted to provide additional flexibility for point sources without causing or contributing to an exceedance of applicable water quality standards?
- What legal authority does MPCA have to complete a TMDL for a waterbody that is not impaired?

**Response to Comment 9:** The 10-yr average chlorophyll-a (Chl-*a*) concentration in Lake Pepin for 2009 through 2018 was 27 ug/L, as compared to the site-specific standard of 28 ug/L. However, the 10-yr period from 2009 through 2018 included higher than normal flow conditions and is not representative of long-term average conditions. The critical condition for Lake Pepin to experience excessive algal growth is during low-flow years. Robust analyses of water quality data and scientific information are presented in [Lake Pepin Site Specific Eutrophication Criteria](#) Report (MPCA 2011). The analyses presented in the site-specific criteria report demonstrate that Lake Pepin does not have additional assimilative capacity for TP under low-flow conditions. Phosphorus loads from point sources become an increasingly significant driver of excessive algal growth in Lake Pepin under low-flow conditions. 10-yr average phosphorus concentrations in Lake Pepin were 134 ug/L, exceeding the site-specific standard of 100 ug/L. The TMDL needs to protect waters under anticipated future flow and land use conditions. The WLAs provided by the TMDL are reasonable goals to restore and protect Lake Pepin under anticipated future conditions. Section 3.3.1 of the TMDL report has been revised in response to this comment.

Also, please see the attached assessment summary, included as Attachment B to this Response to Comments, for additional information.

**Comment 10:** Request for a Contested Case Hearing. It is our understanding that the Minnesota Cities Stormwater Coalition (“MCSC”) is submitting a contested case hearing request related to the draft Lake Pepin TMDL. The CGMC recognizes that MCSC’s mission is to represent the interests of municipal stormwater permit holders, many of which are also CGMC members. The CGMC supports MCSC’s contested case hearing request and hereby incorporates by reference MCSC’s comments and contested case hearing request into this letter.

To ensure that the unique interests of wastewater treatment facilities are represented in this process, the CGMC also requests that MPCA hold a contested case hearing pursuant the Clean Water Legacy Act and Minn. R §§ 7000.1800 and 7000.1900 to address the disputed issues of material fact and requests for relief identified in this letter. The CGMC asserts that there is a reasonable basis underlying the disputed material factual issues raised; that MPCA’s commissioner has jurisdiction over this matter; and that that holding a contested case would allow the introduction of information that would aid MPCA in resolving disputed facts and making a final decision related to the TMDL. If requested or appropriate, the CGMC will submit a list of prospective witnesses to be called at a hearing; a proposed list of publications, references, or studies to be introduced at a hearing; and the approximate time required for CGMC to present the matter at a hearing.

Finally, CGMC requests the opportunity to be present for any future discussion related to the TMDL and the disposition of this or other contested case hearing requests to ensure that the unique perspectives of municipal wastewater facilities are addressed.



**Response to Comment 10:** CGMC will be invited to future public meetings regarding the TMDLs. Please see Response to Comments #18 through #28 in response to the request for a Contested Case Hearing.

### **Minnesota Environmental Science and Economic Review Board**

**Comment 11:** As indicated above, most of our members have already received phosphorus effluent limits in their permits based on the draft TMDL because of MPCA’s strategy to assign limits to permittees via pre-TMDL phosphorus effluent limit review memoranda. As a result, many of our members were forced to make significant investments to comply with phosphorus limits based on the draft TMDL—before having an opportunity to comment on the basis for those limits through the TMDL process—as required by the Minnesota Clean Water Legacy Act. We are also concerned that MPCA failed to estimate the compliance costs associated with the TMDL as required by state law. We request that MPCA update its costs analysis to meet the requirements in state law and specifically include an estimate of the costs already expended by municipal wastewater treatment plants (WWTPs) to address the TP waste load allocation in the draft TMDL.

**Response to Comment 11:** The MPCA commends WWTPs for the significant progress that has been made in reducing the discharge of phosphorus from their facilities. A rough estimate suggests that approximately 320,585 lbs/yr of phosphorus have been removed from WWTP permitted discharges between 2009 through 2011 and 2017 through 2019. The total cost to achieve this reduction has not been tabulated. However, cost per pound of phosphorus removal is estimated to range between \$7 to \$11 to achieve 1 mg/L TP, \$39-\$175 to achieve 0.8 mg/L TP, and \$91 to \$344 to achieve 0.1 mg/L TP (The Minnesota Nutrient Reduction Strategy, Section 5.6.1). Also, please see Response to Comment #7 regarding implementation of water quality-based effluent limits to restore impaired waters in advance of an approved TMDL. The MPCA has prepared an estimate of municipal wastewater facility costs associated with attainment of the Lake Pepin TMDL WLAs for TP. The estimated costs are summarized in a memorandum titled “Lake Pepin TMDL WWTP phosphorus reduction cost estimates,” dated December 21, 2020. The memorandum is included as Attachment A to this Response to Comments document.

The TMDL report has been revised to include additional cost information for WWTPs.

**Comment 12:** In our review of the draft TMDL report we were pleased to see water quality data indicating that Lake Pepin has achieved compliance with the applicable eutrophication water quality standard. As indicated by the TMDL report, this progress is largely the result of the efforts of WWTPs throughout the state. We are confused, however, by MPCA’s assertions within the TMDL and other public communications that the lake is merely approaching compliance and remains impaired. These statements appear inconsistent with the data presented in the report.

The Lake Pepin site-specific water quality standard is 100 micrograms per liter (“ug/L”) for TP and 28 ug/L for algae, which is represented as chlorophyll-a or “chl-a.”<sup>2</sup> The TMDL report indicates that the TP criteria is approaching compliance, but is still exceeded (the average TP concentration is 134 ug/L); however, as indicated by the figure below, the chl-a criteria has been achieved by reaching an average of 27 ug/L.

It is our understanding that compliance with the standard is assessed using the most recent 10 years of data and an exceedance of both the TP and algal criteria are required to demonstrate an impairment.<sup>3</sup> As a result, the data presented by MPCA demonstrates that Lake Pepin is not presently impaired based on state regulations, the adopted site-specific standard and applicable assessment guidance.

MESERB is concerned that MPCA failed to directly address this issue in the TMDL. MPCA should either amend the TMDL to reflect that Lake Pepin is no longer impaired or provide a factual and legal basis supporting the agency's assertion that Lake Pepin remains impaired. Moreover, the data presented in the TMDL suggests that Lake Pepin has additional assimilative capacity for phosphorus and that the proposed phosphorus waste load allocation could be adjusted to provide regulated point sources additional flexibility. MPCA should revise the TMDL to address this question and update the proposed phosphorus waste load allocation to allow for additional assimilative capacity.

**Response to Comment 12:** Please see Response to Comment #9. Please note that the WWTP WLAs included in the TMDL are based on average wet weather design flows, which allow flexibility. Also, WLAs must be written for a pollutant being discharged, such as TP, and cannot be written for Chl-*a*. Finally, even if a previously impaired water body is restored to meet water quality standards and is removed from the 303(d) list of impaired waters, the TMDL and associated WLAs remain in-effect to provide protection and continued attainment of standards.

**Comment 13:** Finally, it is our understanding that the Minnesota Cities Stormwater Coalition (MCSC) and the Coalition of Greater Minnesota Cities (CGMC) may submit contested case hearing requests related to the draft Lake Pepin TMDL. Given that MESERB is the only entity in the state that exclusively represents the interests of WWTPs in Greater Minnesota, we request to be informed and present for any future discussion related to the TMDL and we assert the right to intervene in any future contested hearings in this matter.

**Response to Comment 13:** The MPCA acknowledges Minnesota Environmental Science and Economic Review Board (MESERB's) right to petition to intervene if contested case hearings take place. The MPCA does not anticipate discussions related to the TMDL that will change the WWTP WLAs presented in the TMDL, unless those take place with individual WWTPs as part of the NPDES process. The TMDL report has not been revised in response to this comment.

### **Carrie Jennings/Freshwater**

**Comment 14:** On p. 18 of the report, it is stated that "phosphorus binds to soil..." A later, more extensive analysis is cited as work of the NRCS on p. 43-44 and allows for more nuance in P source and cycling.

Key points are that, if soils are loaded with P, they will more likely be sources of dissolved P and that tile drainage water can be a significant source of dissolved P.

Given that most of the agricultural fields in the modeled watersheds have double the amount of P needed for crop production, we think that dissolved P needs to be included as a significant source.

- How would your modeling scenarios change if only 24 % of the P was attributable to erosion?
- What BMPs would you suggest if up to 44% of the P were leaving the fields in dissolved form through tile drainage?

- What monitoring would you suggest if P easily dissolved from P-saturated fields and near-channel legacy sources but reattached to sediment in the water column?

These and other complexities in P cycling are suggested in work of the Finlay group at the University of Minnesota, Dept. of Ecology and Evolutionary Biology. They constructed a total P budget as a follow up to the MPCA-funded work on sediment budgets in the Le Sueur watershed. We believe that the complexities of P cycling need to be taken into account in the scenarios being modeled for Lake Pepin.

In addition, something that is explicitly not taken into account when developing a TMDL is the impact of future climate change. By using a decade or more of past weather and flow data, we do not have an understanding of the profound impact that increases in total rainfall, rainfall intensity and increases in temperature will have on eutrophication. We urge the MPCA to include the results of down-scaled climate models of the Keeler group\*\* and the range of possible climate futures into their modeling.

**Response to Comment 14:** The MPCA agrees with the issues related to P-cycling raised in the comment. To clarify, the modeling conducted to support the Lake Pepin TMDL includes multiple phases of phosphorus, including dissolved and particulate. P-cycling in the modeling was represented using the available data and the parameters and processes as described in the modeling report referenced in the TMDL report (LimnoTech 2009a). However, the site-specific criteria include a TP criterion. Therefore, the TMDL is written for TP. Even so, the MPCA acknowledges the importance of reducing dissolved forms of phosphorus as they are typically more bioavailable. Planning for implementation to meet the TMDL through WRAPS and 1W1P efforts should take into account the complexities of P-cycling.

In response to the comment to include results of climate models, the MPCA modeling did not consider potential future climate change scenarios. The modeling did include a long-term simulation representing a wide range of historical climate conditions. The critical condition for excessive algal growth in Lake Pepin in response to phosphorus loadings is during low-flow conditions. While additional modeling to consider climate change scenarios may be informative for implementation planning, we do not anticipate it would lead to changes in the TMDL.

The TMDL report has not been revised in response to these comments.

### **City of Cottage Grove**

**Comment 15:** The TMDL MS4 WLA of 0.35 lbs./acre/year loading will be challenging for many MS4s to achieve. The commenter used the MIDS model to illustrate that TP loads from residential, commercial, and industrial land uses will need to be reduced by 63% to 81%. However, wet sediment NURP ponds have an expected TP removal rate ranging from 34% to 60%, sand filter BMPs typically provide 45% to 55% TP removal, and only iron-enhanced sand filters (60% to 70%) or infiltration basins (90% to 100% TP removal) would be likely to provide the TP removal needed to meet the WLA. Iron-enhanced sand filters are a relatively new technology and the long-term operational success is not known. Infiltration basins work well in areas with appropriate conditions (soils, groundwater, non-DWSMA, etc.) but can be expensive to construct, operate and maintain. Therefore, achieving the WLA is likely to be challenging and costly for our citizens to meet. Requested Action: Place more of the burden for the desired Lake Pepin TP reductions on the agricultural non-point sources rather than on the MS4s.

**Response to Comment 15:** The MPCA agrees the loading rate could be challenging for some cities. The MIDS modeling done for this scenario does not include natural water bodies, parkland, or other land uses that have lower P concentrations, less impervious, or that act as P sinks. Other management strategies, such as street sweeping, are also not included. The P concentrations for some of the modeled land uses are also likely on the high end, as illustrated in the Minnesota Stormwater Manual. The MPCA ran multiple scenarios using the MIDS calculator and MPCA Simple Estimator. These modeling results, as well as the 2008 Nondegradation analysis conducted by 30 cities and recent monitoring of 6 streams in the Twin Cities area, indicate the loading rate is achievable. Additional data collected by MCES between 2005 and 2014 from 6 drainage basins in the Twin Cities Metropolitan Area showed the 10-year average from each basin to be below 0.35 lb/acre/year. Also, we believe the TMDL establishes a reasonable goal for agricultural nonpoint sources. The TMDL report has not been revised in response to this comment.

**Comment 16:** The TMDL explains that MS4 Permittees are required to show progress and document compliance with numeric waste load allocation (WLA) goals or provide a strategy and schedule to meet the WLA. A new WLA for the MS4s requires additional costs for construction, operation, and maintenance of stormwater BMPs as well as additional effort for analysis and reporting, which are not accounted for in current City funding mechanisms. Requested Action: Either provide funds to MS4s for the implementation and administration needed to comply with the WLA or place more of the burden for the desired Lake Pepin TP reductions on the agricultural non-point sources rather than on the MS4s.

**Response to Comment 16:** Please see Response to Comment #5. The MPCA Stormwater Program is working with the MCSC to develop base loading scenarios which permittees can use to predict pollutant loads and load reductions associated with implementation of BMPs. This will be coupled with appropriate training and guidance developed by the MPCA. This should greatly reduce or eliminate costs associated with calculating pollutant loads and load reductions. For permittees who wish to not use these tools, guidance in the Minnesota Stormwater Manual provides information for typical costs associated with modeling. Also, we believe the TMDL establishes a reasonable goal for agricultural non-point sources. The TMDL report has not been revised in response to this comment.

**Comment 17:** The contributing drainage area of Lake Pepin includes large areas of Minnesota and Wisconsin, as well as smaller areas of Iowa and South Dakota. Due to the small percentage contributions of runoff from South Dakota and Iowa, it is understandable why waste load allocations are not included for those states, but since Wisconsin contributes significant runoff to Lake Pepin (including over 50% of the St. Croix River basin), an approved WLA for Wisconsin should also be assigned to Wisconsin. The TMDL report includes a computed WLA for Wisconsin, but Section 5.0 of the report indicates that the U.S. EPA “...cannot approve allocations for Wisconsin loads in a Minnesota TMDL.” More information is requested on why has this TMDL process been followed if a different approach is needed for the waste load allocations for Wisconsin to be approved. Requested Action: The process should be corrected so the EPA can also approve the waste load allocations for Wisconsin, so both Wisconsin and Minnesota share in the waste load allocation efforts.

**Response to Comment 17:** The MPCA agrees that both Wisconsin and Minnesota should share in the efforts to meet the TMDL and has developed the TMDL accordingly in coordination with Wisconsin Department of Natural Resources. The TMDL accounts for loadings from Wisconsin and expectations for allowable phosphorus loading rates commensurate with those included in the

TMDL for Minnesota sources. Specifically, the Wisconsin loads in the St. Croix Basin are accounted for in the Lake St. Croix Phosphorus TMDL. The Wisconsin loads contributing to Lake Pepin downstream of the St. Croix River are accounted for and presented in Appendix E of the TMDL report. Section 5.0 of the TMDL report has been revised in response to this comment to clarify that reasonably allowable phosphorus loads from Wisconsin to restore and protect Lake Pepin have been considered and accounted for in the TMDL.

## **Minnesota Cities Stormwater Coalition**

**Comment 18: Work with the stakeholders** – In the course of responding to each and all of the comments below and revising the TMDL Report, please work with the stakeholders, especially the MS4 permittees via MCSC. Please know that MCSC stands ready to talk and work with the MPCA on any and all of these issues. MCSC firmly believes that the MPCA’s best and most effective work is done when the Agency talks and works with stakeholders in a significant and meaningful manner.

**Response to Comment 18:** The MPCA agrees with MCSC on working together to restore and protect our State’s waters, including Lake Pepin and the Mississippi River. We look forward to continuing to work constructively towards this shared objective. The TMDL report has not been revised in response to this comment.

**Comment 19: Estimated costs for MS4 permittees** – Please provide, as per MN statute, the estimated costs for implementation and compliance for the MS4 permittees in the TMDL drainage area. These cost estimates should address the following costs for MS4 permittees:

- Implementation of BMPs (structural and nonstructural) to reduce phosphorus loads
- Modeling (any type) to estimate P loading and make any determinations
- Reporting and monitoring (Phase I cities) under the MS4 permits – including estimated pollutant load reductions and lists of BMPs
- Determining the area served by the MS4-permitted stormwater collection and conveyance system

To inform this estimate, please undertake an initiative to estimate the costs and water quality benefits for MS4 permit compliance throughout the State of Minnesota.

Please provide a complete explanation of why the MPCA invested in a significant and expensive cost study for this TMDL (“Lake Pepin Watershed Full Cost Accounting Project”, July 2012) that said nothing about the costs for MS4 permittees. Please provide an explanation of how these omissions represent the MPCA’s views of the MS4 permit program and the roles and responsibilities of MS4 permittees to improve and protect water quality in Minnesota.

Section 8.5 of the TMDL Report is silent on the topics of the implementation and compliance costs for MS4 permittees. This is insufficient relative to the cost estimation requirements in MN Statute 114D.25.Subd.1(b)(1) and (2). The fact of the matter is that this TMDL Report does not fulfill the statute’s requirements.

We acknowledge that developing reasonable accurate cost estimates will be difficult. The statute does not list difficulty as an acceptable excuse for not meeting the statute’s requirements.

Furthermore, MCSC suggests that a large part of the reason that developing these cost estimates is difficult is because the MPCA has never estimated the costs and water quality benefits of compliance with the MS4 permits. In light of the number of permittees and the costs of compliance, an initiative by the MPCA to estimate the costs and benefits of the MS4 permit program is long overdue. MCSC would be happy to work with the MPCA on such an initiative. MCSC knows of applied economists at the University of Minnesota that are interested in such a project. MCSC has also discussed such a project with EPA staff and they have expressed interest. An initiative in Minnesota could serve as a model for the United States.

It is mystifying and disheartening for the MS4 permittees to see that the MPCA invested in a significant and expensive cost study for this TMDL (“Lake Pepin Watershed Full Cost Accounting Project”, July 2012) that said nothing about the costs for MS4 permittees. In 177 pages, the term “MS4” does not appear once. Please note the title of this study.

Please note that even relatively small expenses for each MS4 permittee become a significant aggregate expense when multiplied times the number of MS4 permittees in the TMDL drainage area.

**Response to Comment 19:** Please see Response to Comments #2, #3, #4, and #5.

We acknowledge that The Lake Pepin Watershed Full Cost Accounting Project did not evaluate costs for MS4s. The Full Cost Accounting project was focused on agriculture. Omitting MS4s from a given work does not indicate lesser importance or represent MPCA’s view of MS4s. The MPCA dedicates significant time and resources to working with MS4 permittees.

**Comment 20: Delist Lake Pepin** – Delist Lake Pepin for eutrophication. In a recent presentation, the MPCA provided data showing that the chlorophyll-a levels in Lake Pepin over the past 10 years have been below the WQ standard. Chlorophyll-a is the measure for the meaningful negative impact of high P loading: algae blooms. Please declare victory, delist Lake Pepin, and stop wasting everyone’s time and money. Please see the comments from the Coalition of Greater Minnesota Cities for more details. MCSC supports and concurs with the CGMC comments on this topic, and includes them here by reference.

**Response to Comment 20:** Please see Response to Comment #9. The TMDL report has not been revised in response to this comment.

**Comment 21: List of local TMDLs** – Please provide a list of all local phosphorus TMDLs that include any of the MS4 permittees listed in this TMDL Report, with the associated WLAs and load reductions. Please provide this list as an appendix to this report and as a “live” list, in the Minnesota Stormwater Manual, that is updated and kept current by the MPCA. In this list, please provide the name and contact information for the entity that is serving as the “keeper” or “accountant” for each TMDL.

This TMDL Report specifically refers to local and smaller-scale TMDLs that may impact MS4 permittees. Those permittees would find the list described above to be a useful and necessary tool for their compliance and implementation. As the entity running the statewide TMDL program, the MPCA is the only proper entity to create and maintain this list.

**Response to Comment 21:** The MPCA agrees that individual MS4 permittees would benefit from an awareness of the waters to which they discharge, which of those waters are impaired, and what TMDLs include WLAs for their MS4. The MPCA is happy to work with individual MS4 permittees to

identify applicable TMDLs. Alternatively, the MPCA will provide this list at the time of MS4 permit reissuance. The TMDL report has not been revised in response to this comment.

**Comment 22: Nondegradation reports** – Please provide information and clarification of the role of the 2008 Nondegradation Reports in the context of this TMDL. To the extent possible, allow the 30 nondeg cities to use these reports in the context of this TMDL.

In 2008, 30 Minnesota cities submitted data on TSS and P loading for their jurisdictions as part of their Nondegradation Reports. Each city modeled their jurisdictions to determine these loadings. These modeling efforts were done at some expense for each city. It would be good if they had value in the context of this TMDL. It would be good if these cities could avoid the expense of updating these reports. It should be noted that, under the MS4 General Permit and local watershed rules, increased P loading were not allowed during most or all of the time since these reports were generated. It should also be noted that funds spent by MS4 permittees on modeling and estimating loads do not achieve any positive environmental outcomes and would be better spent on local implementation.

**Response to Comment 22:** Please see Response to Comment #6. The nondegradation reports were one source of information on pollutant loading. These reports can be used in the context of this TMDL but must be updated. The TMDL report has not been revised in response to this comment.

**Comment 23: Make the target loading more prominent** – Please make this determination, in Section 5.2.2 of the TMDL Report more prominent: *“the WLA for each MS4 included in the TMDLs in this report is 0.35 lb/acre/year for the area served by the stormwater collection and conveyance system.”*

This text is the most important item in this section, especially for the MS4 permittees. It should be at the beginning of the section and highlighted. It can be repeated later in the section. Without making this more prominent, the references to percent load reductions in this section are very confusing.

**Response to Comment 23:** Please see Response to Comment #2. Section 5.2.2 of the TMDL report has been revised in response to this comment.

**Comment 24: Reporting on pollutant load reductions** – Please work and talk directly with MS4 permittees and watershed organizations to clarify how the pollutant load reductions associated with implemented BMPs should be estimated, aggregated, and reported. Specifically, please address which permittees should include which BMPs and associated load reductions in their MS4 Permit reports.

The effort and expense to list, estimate the associated load reductions, and report on all the BMPs implemented in this TMDL drainage area will be significant. This is an important aspect of MS4 permitting. The MPCA should play a significant role in describing and clarifying how this work should be done. MCSC is willing to work with the Agency on this.

**Response to Comment 24:** The MPCA Stormwater Program recognizes the challenges faced by MS4 permittees needing to estimate loadings or load reductions and track and report those loads. The Stormwater Program is working with the MCSC to develop base loading scenarios which permittees can use to predict pollutant loads and load reductions associated with implementation of BMPs. This will be coupled with appropriate training and guidance developed by the MPCA. The TMDL report has not been revised in response to this comment.

**Comment 25: Work outside the MS4 conveyance systems** – Please clarify how work to reduce phosphorus loads to the Mississippi River and Lake Pepin that is done by MS4 permittees but outside of their conveyance system and land that drains to it should be estimated, “credited”, and reported. This clarification should address, at a minimum, projects that include in-lake treatment, streambank restoration & stabilization, and ravine restoration & stabilization.

Some of the most cost-effective P load reduction implementation strategies include work done outside of an MS4 conveyance or land that drains to it. Some MS4 permittees do such work and wish to know how they should estimate, “credit”, and report the load reductions associated with such work.

Determining whether such work may be “creditable” under this TMDL depends, to a certain extent, on how the TMDL model was constructed and the TMDL WLA was calculated. The MPCA should explain all this, relative to the MS4-permitted land areas, and how it informs the “credibility” of work done outside of an MS4 conveyance system and the land that drains to it.

**Response to Comment 25:** Please see Response to Comment #2, #3, and #4 above. The TMDL report has not been revised in response to this comment.

**Comment 26: Areas served by the conveyance system** – Please revisit the concept of “the area served by the stormwater collection and conveyance system” and how this concept informs the WLA for MS4 permittees.

Recent phone conversations with MPCA staff have indicated that the modeling for this TMDL, that served as the basis for the WLA, did not get to this level of detail. The model may have just included each MS4 permittees’ entire political jurisdiction. If this is the case, it may be inappropriate and unsupported to use “the area served by the stormwater collection and conveyance system” as part of the basis of the WLA and subsequent reporting, modeling, and determinations by MS4 permittees.

**Response to Comment 26:** As discussed in Response to Comment #2, the TP TMDL WLA for MS4s is applied to discharges from the MS4 collection and conveyance system to a Water of the State. Given the large number of MS4s addressed by the Lake Pepin TMDL and the challenges associated with clearly delineating the areas served by each MS4 collection and conveyance system, a relatively simple approach was used to calculate the MS4 WLA. The MS4 WLA was calculated using an allowable loading rate of 0.35 lb/acre/year and multiplying that by the jurisdictional area of each MS4. The entire jurisdictional area was used to calculate the WLA, including areas that may not be served by the MS4 collection and conveyance system, such as undeveloped land and Waters of the State. This approach results in a WLA that is greater than 0.35 lb/acre/year when applying the WLA to the average loading rate across discharges from the area served by the MS4 collection and conveyance system.

This WLA was developed as a reasonable goal for urban stormwater discharges. Data from 2008 MS4 Nondegradation Reports from 30 cities suggests that half of the communities were achieving 0.35 lb/acre/year at that time. Additional data collected by MCES between 2005 and 2014 from 6 drainage basins in the Twin Cities Metropolitan Area showed the 10-year average from each basin to be below 0.35 lb/acre/year.

The TMDL report has been revised to clarify the development and application of the MS4 WLA.



**Comment 27: Monitoring data from various sources** – Please take an active role in collecting and coordinating water quality data from the MPCA, Met Council, and watershed organizations to estimate the current phosphorus loadings from various MS4 permittees' land areas.

The water monitoring data from these various organizations may be quite valuable in estimating the current phosphorus loads from any MS4 permittees. Collecting, normalizing, and making sense of this data will be a complex and challenging task. The MPCA has the technical capacity to help with this task. As the state agency overseeing all this work, the MPCA has an appropriate role. The MPCA should also be active in this process because it will ultimately be the recipient of estimates, models, and reports based on this data.

**Response to Comment 27:** The MPCA believes simple modeling tools, such as the MPCA Simple Estimator, are most useful for estimating loads and load reductions associated with implementation of BMPs. The MPCA is working with the MCSC to develop base loading scenarios which permittees can use to predict pollutant loads and load reductions associated with implementation of BMPs. This will be coupled with appropriate training and guidance developed by the MPCA. The MPCA would be willing to discuss with MCSC the potential role of monitoring data in pollutant load calculations, but as the comment points out, this could be a very significant task and we would need to identify specific benefits from such an exercise.

**Comment 28: Methodology to estimate P loads** – Please work with the MS4 permittees to develop a simple and inexpensive method to estimate phosphorus loads from a city.

In a recent phone conversation between MCSC and MPCA staff, a relatively simple and inexpensive method to estimate phosphorus loads from cities was discussed. MCSC is very interested in continuing this discussion. Such a methodology, if acceptable to the MPCA, could significantly reduce the costs for MS4 permittees.

**Response to Comment 28:** The MPCA Stormwater Program is working with the MCSC to develop base loading scenarios which permittees can use to predict pollutant loads and load reductions associated with implementation of BMPs. This will be coupled with appropriate training and guidance developed by the MPCA. The TMDL report has not been revised in response to this comment.

## **Met Council**

**Comment 29: Modeling Approach** – In Section 4.1 on page 49 of the Draft Report, the MPCA states that its modeling was calibrated based on monitoring data from 1996 through 2006 and that the model used data from 1985 through 1995 as a confirmation dataset. The MPCA should consider more recent data that better reflect current conditions and the significant reductions made by the Council.

Point source phosphorous loading has decreased significantly since 2006. For example, the Council reduced the median total phosphorus concentration at its Metro Plant from 3.4 mg/L in 2000 to approximately 0.3 mg/L in 2011, a reduction of approximately 91 percent based on concentration. Given that the Council treatment plants alone have accomplished large reductions in effluent discharge phosphorus loadings, updated effluent discharge data from the period 2007 to present should be used to better characterize current wastewater loadings that are associated with water quality improvements in Lake Pepin that have occurred since 2006.

In addition to correcting the model, MPCA should consider re-assessing Lake Pepin for impairment post-2006 since the conditions that led to the original identification of impaired water quality may no longer exist. If the re-assessment finds water quality conditions in Lake Pepin to be impaired in the period since the large point source reduction in phosphorus began, then the re-assessment should include a description of the basis for any impairment, a description of how that condition is measured, and descriptions of threshold conditions for restoration of beneficial uses.

**Response to Comment 29:** The MPCA appreciates that revisiting models with recent data can be an informative and useful process. The Lake Pepin model was previously developed using an extensive dataset covering more than 21 years. Multiple years included intensive monitoring efforts specifically focused on informing the model during critical low-flow conditions. A benefit of mechanistic modeling is the ability to simulate conditions outside the range of the observed data, such as reduced WWTP loads. Multiple scenarios were simulated using the model to examine the benefits of WWTP load reductions as well as other source load reductions. While revisiting the model with recent data would be beneficial, such an effort would require time and expenses. Given the extensive dataset previously used to develop and calibrate the model, any updated modeling would be expected to provide incremental improvements in model-data fit and system understanding. The site-specific criteria and TMDL loading capacity would not be expected to change significantly. The TMDL report has not been revised in response to this comment.

**Comment 30: MS4s** – Section 8.3.3 on page 105 of the Draft Report, links to the MPCA’s MS4 program page and states “The MPCA’s MS4 program provides guidance for addressing TMDL requirements in MS4 General Permit applications and SWPPP documents.”

The Council did not find any guidance for addressing TMDL requirements on the linked MS4 program page.

**Response to Comment 30:** The links will be corrected once the Stormwater Manual is back up. The TMDL report has not been revised in response to this comment.

**Comment 31: Literature Cited** – Section 10 at page 114 of the Draft report cites: “LimnoTech Inc. 2009a. Upper Mississippi River – Lake Pepin Water Quality Model Development, Calibration, and Application. Prepared for the Minnesota Pollution Control Agency. Prepared by LimnoTech. July 2009.”

The Council could not find a link to this source on the MPCA website. Because the MPCA calculated much of the loading capacity using this model, the Council requests that the MPCA provide this reference on its website.

**Response to Comment 31:** The modeling report is available from MPCA upon request. The MCES was an instrumental partner in the development of the model and played a key role on the Scientific Advisory Panel. The TMDL report has not been revised in response to this comment.

**Comment 32: Appendix B WLA calcs** – Appendix B on page 121 lists the waste load allocations for wastewater treatment plants. The allocation for the Council’s Metro WWTP is listed at 120,533 kg/yr and 330.282 kg/day. The allocation for the Council’s Eagle’s Point WWTP is listed as 8,220 kg/yr and 22.521 kg/day. If MPCA had calculated these wasteload allocations in accordance with its formula for wasteload allocations for WWTPs, the wasteload allocations would be larger.

Section 5.2.1 on page 64 of the Draft Report explains the MPCA’s formula for calculating wasteload allocations to meet Lake Pepin and Pool 2 TMDLs. Table 19 on page 65 of the Draft Report provides that for plants with a flow of > 20 mgd (Metro WWTP) the annual WLA is calculated by multiplying the AWWDF by 0.3. For plants with a flow between 1 and 20 mgd (Eagle’s Point WWTP) the annual WLA is calculated by multiplying the AWWDF by 0.8 . As illustrated in the chart below, using the formulas in table 19 results in a higher WLA for the Metro and Eagle’s Point WWTP than what is contained in Appendix B.

The Council requests that the MPCA explain this difference and identify any other WWTPs that have WLAs that are more stringent than the formula in Table 19.

WWTP	AWWDF (MGD)	WLA Factor (Table 19)	WLA (kg/yr) using Table 19	WLA (kg/yr) in Appendix B	Difference (kg/yr)
Metro	314	0.3	131,040	120,553	10,487
Eagle’s Point	11.9	0.8	13,152	8,220	4,932

**Response to Comment 32:** As discussed with Metropolitan Council Environmental Services (MCES) staff on 6/24/2020, modifications to the categorical WLA concertation assumptions were made for the Metropolitan and Eagle's Point WWTFs as part of the 2015 Met Council - Mississippi River Basin TP Permit (Basin permit). Facility specific WLA assumptions for the five WWTFs participating in the Basin permit are described in detail in the Basin permit's Fact Sheet (Table 11) and the MPCA's 6/10/2013 memorandum 'Draft: MCES TP umbrella permit allocations'. See the 'Other point sources directly to or near model domain' section starting on Page 4. The TMDL has been revised to address this comment by including a footnote to Table 19 specifying facility specific TP concentrations for the Metro and Eagle’s Point WWTPs.

**MnDOT**

**Comment 33:** Main concern relates to the feasibility of MS4s meeting the WLAs in a cost-effective manner.

Minnesota Statute 114D.25 requires the MPCA to include in the TMDL report a cost estimate for compliance with the TMDL. The draft report states that determining costs would be difficult. While the draft report discusses cost to agriculture and wastewater in some detail, the draft does not appear to address the costs to MS4s. The draft report also states that many MS4s may already be meeting the proposed 0.35 lb/acre/year WLA, perhaps suggesting that compliance costs to the MS4s would be low. One simple model suggests that loading from urban areas and roadways could be well over 1 lb/acre/year. As such the cost to implement best management practices (BMPs) to reach the WLA could be substantial for MS4s. Even if an MS4 is already meeting the goal, there may still be substantial costs to conduct an analysis to provide an accurate estimate of current and future loading. Further, costs to maintain and replace the BMPs are also not addressed.

The draft report should be amended to include cost estimates for compliance for MS4s. This estimate should include costs to MS4s for the loading analysis, and BMP implementation and long-term maintenance and replacement. The cost estimate should cover a range of scenarios comparing various WLA goals. A novel approach would be to choose the WLA goal based in part on cost effectiveness. This may be especially productive given the relatively small contribution from MS4s, and therefore small

## Response to Public Comments on the Lake Pepin Watershed Phosphorus TMDL

improvement at potentially high costs, compared to all other sources. Another consideration should be the relative cost to improve the quality of Lake Pepin given the recent trend of substantial improvement in water quality.

**Response to Comment 33:** Please see Response to Comments #2 and #5.

## Office Memorandum

DATE : December 21, 2020

TO : Justin Watkins  
Watershed Division

FROM : Marco Graziani  
Casey Scott  
Municipal Wastewater Section  
Municipal Division

SUBJECT : Lake Pepin TMDL WWTP phosphorus reduction cost estimates

This memo estimates municipal wastewater facility costs associated with attainment of Lake Pepin TMDL phosphorus wasteload allocations (WLAs). The calculations require data inputs for phosphorus removal cost, total facility operating costs, and annual phosphorus effluent flow weighted mean concentrations (FWMC).

#### Annual cost of phosphorus removal

The calculations use a general per-capita removal cost. Individual facility costs may deviate from the average costs used in these calculations. Per capita costs are from the 2014 Minnesota Nutrient Reduction Strategy<sup>1</sup>. The MCES-Metropolitan WWTP removal costs are adjusted based on the 100+ mdg design flow category values presented in Table 5-16 of the Nutrient Reduction Strategy instead of the full per capita cost.

We associated each wastewater permit with a municipality to estimate the number of people served. Multiplying the people served by per capita cost produced and annual cost to reach each concentration goal.

Cost for facilities – excluding MCES Metropolitan facility

\$10 per capita to get 1.0 mg/L

\$14 per capita to get 0.8 mg/L

Cost for MCES-Metropolitan facility derived from 2013 Nutrient Reduction Strategy.

\$3.53 million per year to meet 1.0 mg/L goal

\$4.85 million per year to meet 0.8 mg/L goal

\$7.30 million per year to meet 0.3 mg/L goal<sup>2</sup>

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<sup>1</sup> Minnesota Nutrient Reduction Strategy, Section 5.6.1.

<sup>2</sup> Estimated 0.3 mg/L level reduction costs were interpolated from available data published in the Minnesota Nutrient Reduction Strategy (2014).

We calculated the annual FWMC for each facility and assigned effluent concentration goals based on the TMDL's WLA categorical concentration assumptions<sup>3</sup>. If the annual FWMC is below the goal the annual costs are considered to be meeting the WLA goal. The annual costs are considered future investments when the FWMC exceeds the annual goal. MCES facilities were assigned the dollar amount for a 0.8 mg/L goal until that level was achieved, then MCES' four largest WWTPs move to the cost for the 0.3 mg/L goal.

EPA Minor facility goal = 1 mg/L

EPA Major facility goal = 0.8 mg/L

MCES Metropolitan, Seneca, Empire, and Blue Lake WWTPs goal = 0.3 mg/L.

Percent of total operating cost

Wastewater Infrastructure Needs Survey (WINS) annual operating and debt retirement cost data reported by Minnesota municipalities were used to benchmark the reduction cost estimates. We compared the self-reported annual operating and debt retirement costs to the estimated reduction costs. The MCES facilities are represented as a whole in the WINS survey.

**Lake Pepin TMDL goal attainment cost estimates for 2019**

	Annual cost for facilities meeting the WLA goal. (Million \$/year)	Future investment needed for WLA attainment (Million \$/year)	Total WLA attainment cost (Million \$/year)
All Pepin	24.3	13.0	37.3
Non-MCES	9.4	2.2	11.6
MCES	14.9	10.8	25.7

**Estimated phosphorus reduction costs in relation to total wastewater costs for 2019**

	WINS Survey O&M Costs (Million \$/year)	WINS Survey Debt Service Costs (Million \$/year)	Total Wastewater Costs (Million \$/year)	Total Lake Pepin TMDL WLA Attainment Cost (Million \$/year)	Lake Pepin Costs as a Percentage of Total Wastewater Treatment Costs
All Pepin	305.5	214.1	519.6	37.3	7.2%
Non-MCES	139.5	75.0	214.6	11.6	5.4%
MCES	166.0	139.0	305	25.7	8.4%

1. MCES attainment cost is higher as a percentage of the total due to the low 0.3 mg/L goal assigned to their 4 largest WWTPs.
2. The MCES future investment is for the Blue Lake WWTP to reduce from 0.5 to 0.3 mg/L.

<sup>3</sup> Draft Lake Pepin and Mississippi River Eutrophication TMDL, Table 19.

## Lake Pepin Assessment Approach Summary

**Schedule:** current plan is to assess Lake Pepin in 2023. This may not mean that the assessment decision is made in 2023. COVID delay is becoming general to MPCA's assessment process and scheduling; could impact timing for Lake Pepin.

**Data window:** if assessment is in 2023, data window will be 2013-2022 (10 summers).

**Residence time** is an important consideration, because Lake Pepin is a riverine system and thus not always lake-like. A summer-mean flow of 20,000 cubic feet per second (cfs, as measured at the [Mississippi River gauge at Prescott Wisconsin](#)) provides a residence time for Lake Pepin of approximately 11 days, which is within the 8-14 day range that is often cited as the minimum needed to allow for full algal response to nutrients in lakes (MPCA, 2011).

The lake is used for swimming and especially boating at all but the highest flow conditions. Algae are present above 20,000 cfs, but typically not at levels that impair designated uses. In general, algal growth starts to get problematic at flows at or below 20,000 cfs. From 1988 to 2020, flows at or below 20,000 cfs occurred on 48% of the days during summer on average. From 2010 to 2019 only 28% of the summer days were less 20,000 cfs (see Attachment A).

**Assessment approach:** an assessment team at MPCA will gather data collected over the ten summers (June – September) preceding the assessment year. The data will be evaluated against the site specific standard (SSS) values of 100 ug/l total phosphorus and 28 ug/l chlorophyll-a. The team will study all the data with particular emphasis on flows of 20,000 cfs or lower (per the SSS). That is, the assessment will evaluate lake-wide (four sites), June – September mean values. The assessors will note during their technical process that flows lower than 20,000 cfs at Prescott represent a lake-like condition for Lake Pepin.

**Stakeholder engagement:** the MPCA assessment team will generate preliminary assessment results which will then be shared and discussed with stakeholders. Typically (for smaller scale watersheds) a “professional judgment group” is convened to review preliminary results, offer questions and discussion. For Lake Pepin (and the remainder of the Lower Mississippi River) the details of this process are to be determined but will include sharing of the preliminary results, convening a meeting or forum (probably virtual environment) and taking feedback and questions. MPCA will communicate with key stakeholders like CGMC leading up to the engagement process.

## References

Minnesota Pollution Control Agency (MPCA), 2011. [Lake Pepin Site Specific Eutrophication Criteria](#).

2/24/21

Attachment A: Mississippi River at Prescott flow summary; USGS gauge.

Year	Ave sumr flow for days < 20K cfs	Count of summer days < 20K cfs	Overall summer average flow (cfs)	annual % of sumr days below 20K cfs	10yr moving % below 20Kcfs
1988	4,908	122	4,908	100%	
1989	8,228	118	8,708	97%	
1990	12,782	74	19,984	61%	
1991	14,795	20	33,753	16%	
1992	13,931	80	19,675	66%	
1993		0	59,548	0%	
1994	16,594	36	23,310	30%	
1995	15,441	22	26,184	18%	
1996	12,204	67	20,058	55%	
1997	16,021	52	24,680	43%	48%
1998	10,494	73	17,937	60%	44%
1999	17,897	29	25,798	24%	37%
2000	11,137	90	15,070	74%	38%
2001	11,994	80	25,775	66%	43%
2002	17,523	13	29,852	11%	38%
2003	9,783	68	20,753	56%	43%
2004	12,650	69	24,194	57%	46%
2005	12,209	73	22,542	60%	50%
2006	8,490	108	10,151	89%	54%
2007	8,251	107	10,090	88%	58%
2008	9,286	86	18,214	70%	59%
2009	9,570	122	9,570	100%	67%
2010	18,488	25	28,431	20%	62%
2011	14,407	29	40,994	24%	57%
2012	8,752	60	27,068	49%	61%
2013	10,116	66	27,932	54%	61%
2014	17,135	31	47,243	25%	58%
2015	18,102	46	23,815	38%	56%
2016	18,383	6	37,747	5%	47%
2017	16,115	46	24,903	38%	42%
2018	17,269	13	42,884	11%	36%
2019	18,095	19	42,339	16%	28%
2020	16,218	65	21,645	53%	31%
average	13,352	58	25,326	48%	
				red=dry	
				blue= wet	