



# Phosphorus Rule White Paper

Prepared by



Minnesota Environmental Science and Economic Review Board  
(MESERB),



Coalition of Greater Minnesota Cities  
(CGMC), and



League of Minnesota Cities  
(LMC)

July 2007



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## I. Executive Summary

During the 2006 Minnesota legislative session, the legislators passed the Clean Water Legacy Act (CWLA). One provision in the legislation dealt with the Minnesota Pollution Control Agency (MPCA) and its plan to limit all phosphorus discharges to one milligram per liter (1 mg/L).

Concerns about justification for the rule changes prompted passage of a provision that delayed the implementation date of any change regulating phosphorus discharges until July 1, 2007. Moreover, the provision directed the MPCA submit a report on the scientific basis and rationale for the adoption of a statewide universal phosphorus limit to the Legislature by February 1, 2007. On or about March 9, 2007—approximately five weeks late and only two weeks before policy legislation deadlines in the Minnesota House—MPCA issued its report.<sup>1</sup>

In 2007, the Legislature again delayed implementation of the proposed rule because of the unresolved controversy surrounding its implementation. Under current law, the MPCA's new rule will not be applied until May 1, 2008.

**...the proposed rule change will wastefully mandate phosphorus removal without demonstrating environmental need, even when it can be shown to be unnecessary.**

Currently, mandatory 1 mg/L phosphorus limits are imposed whenever there are direct discharges to lakes and reservoirs or when it can be demonstrated that non-direct discharges affect a lake or reservoir. The mandate is scientifically supportable because the adverse impacts of excessive nutrients on standing waters are well understood and well documented.

The statewide 1 mg/L phosphorus limit proposed by the MPCA, however, would apply to all point-source discharges in the state. The expanded phosphorous limit is arbitrary and ignores the fact that the ability of phosphorus to create environmental impairments in rivers is controlled by a variety of factors: water temperature, turbidity detention time, tree canopy and rate of water flow. Each of these factors can have a significant impact on the likelihood of an environmental impairment.

Phosphorus removal is expensive. It consumes energy and resources, and involves the use of chemicals that are environmentally damaging. In many cases, phosphorus removal simply is not needed. The need for phosphorus removal should be verified on a case-by-case basis as stated in the Phosphorus Strategy adopted by the MPCA in 2000. Unless significantly altered, the proposed rule change will wastefully mandate phosphorus removal without demonstrating environmental need, even when it can be shown to be unnecessary.

**The need for phosphorus removal should be verified on a case-by-case basis as stated in the Phosphorus Strategy adopted by the MPCA in 2000.**

<sup>1</sup> See Appendix 5, Report Overview of “*Phosphorus Rule: Report to the Legislature.*” Full report available online at <http://www.pca.state.mn.us/publications/reports/lrp-gen-5sy-07.pdf>

The MPCA's report to the Legislature failed to show scientific justification for its proposed phosphorus limit and did not shed light on its proposed rule.

This white paper demonstrates that the Agency's proposed phosphorus rule is neither scientifically defensible nor cost-effective. It sets forth public policy rationales for requiring the MPCA to set site-specific phosphorus limits, rather than an arbitrary numerical limit. The white paper concludes that:

1. The MPCA's proposed rule is not consistent with the approach recommended by the United States Environmental Protection Agency (USEPA) and is not required by federal law.
2. The MPCA's proposed phosphorus limit will waste local and state resources, needlessly waste energy, and create new environmental problems.
3. The MPCA's proposed rule will impose arbitrary limits when it can be shown to be unnecessary. For example, the new phosphorous standard would be required even when the implementation of a scientifically-based Total Maximum Daily Load (TMDL) plan concludes that a 1 mg/L phosphorus limit is not needed.
4. The proposed rule ignores legislative directives to ensure that regulation of nutrient discharges appropriately considers the effects of temperature and detention time.
5. MPCA's proposed one-size-fits-all rule is the least cost-effective method of addressing phosphorus impacts.
6. Legislation requiring the MPCA to continue using its site-specific analysis to determine phosphorus limits is necessary and in the public interest.

## II. Rationale for White Paper

The MPCA has been regulating wastewater discharges under the current Phosphorus Rule<sup>2</sup> for more than 30 years. The current rule requires that phosphorus limits be site-specific and tailored to the needs of a particular water body. Under the current rule, all wastewater discharges directly to or affecting a lake automatically receive a 1 mg/L limit. This is an appropriate regulatory methodology because it considers site-specific characteristics that contribute to water quality.

The MPCA soon will formally propose a significantly different approach to phosphorus regulation. The new Phosphorus Rule will actually require all new or expanded wastewater discharges throughout the state to have a 1 mg/L phosphorus limit regardless of the environmental impact a discharge has on a water body. The Minnesota Environmental Science and Economic Review Board (MESERB) and other city organizations have questioned the MPCA's one-size-fits-all approach for many years, believing it wastes local resources and is potentially bad for the environment. These organizations believe MPCA is making a significant mistake by implementing an arbitrary statewide phosphorous standard.

The Minnesota Legislature was also unconvinced by MPCA justifications in 2006 when it included a provision within the Clean Water Legacy Act (CWLA) that delayed the implementation of any new phosphorous discharge standard until July 1, 2007. The CWLA also required the MPCA to report back to the Legislature by February 1, 2007 on the scientific rationale for the proposed change to the Phosphorus Rule. Despite the MPCA's release of *Phosphorus Rule: Report to the Legislature* in 2007, lawmakers again voted to delay application of the rule until May 1, 2008.

This white paper was prepared by MESERB, with support from the Coalition of Greater Minnesota Cities (CGMC) and the League of Minnesota Cities (LMC) to address significant concerns regarding the MPCA's proposal to change the Phosphorus Rule.<sup>3</sup> The white paper is intended to be an historical compilation of the arguments of MESERB and others against the MPCA's statewide phosphorus standard. The white paper examines the rule from a variety of angles. It addresses the rule's legal shortcomings, public policy effects, and the MPCA's lack of scientific justification for the new rule. In addition, the white paper is intended to be a single-source reference that will provide useful background information for environmental attorneys, regulators, and policymakers interested in this issue.

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<sup>2</sup> See Appendix 1, Current Phosphorus Rule, Minn. R. 7050.0211 (2006).

<sup>3</sup> See Appendix 1, Proposed Phosphorus Rule, Minn. R. 7055.0255 (Proposed January 1, 2006).

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### III. Factual Background

#### a. History of Phosphorus Rule

The Phosphorus Rule was first adopted by the Minnesota Pollution Control Agency (MPCA) in 1973 and seeks to address the adverse impact of phosphorus in lakes and reservoirs due to excessive algal growth. The rule imposes a monthly 1 mg/L phosphorus effluent limit where “the discharge of effluent is directly to or affects a lake or reservoir.”<sup>4</sup> The purpose of the rule is to limit nuisance algal growth fed by excess phosphorus in lake systems.

The need to avoid nutrient impacts on lakes has been well documented, and the rule provides a reasonable means to avoid these environmental impacts. Lakes are highly vulnerable to elevated algal growth because of their environment. They have unhindered exposure to light, an inability to rapidly flush contaminants from their water basin, and largely inactive water conditions.

Under current law, the Phosphorus Rule applies only in two circumstances: (1) to a direct discharge to a lake or reservoir, and (2) where the phosphorus discharge is shown to “affect” a lake or reservoir that is located downstream of the discharge. The terms “lake or reservoir” and “affects” are not defined in the rule. The MPCA has been asked for some time to define and interpret these terms in a way that is consistent with the rule’s original intent, which was to regulate discharges to still waters, such as lakes and reservoirs rather than river systems.

**The Phosphorus Rule applies only in two circumstances:  
(1) to a direct discharge to a lake or reservoir, and  
(2) where the phosphorus discharge is shown to “affect” a lake or reservoir that is located downstream of the discharge.**

When a discharge was not directly to a lake or reservoir, the MPCA historically analyzed the “affect” of a discharge on lakes and reservoirs downstream by exercising a “50-mile rule of thumb.” The presumption was that in the absence of more detailed information, an upstream discharge would not “affect” a lake or reservoir (i.e., not cause a significant change in algal growth) more than 50 miles downstream due to dilution of the phosphorus discharge.

#### b. History of Phosphorus Strategy

Over time, collection of additional scientific data made it clear that the MPCA’s interpretation of the rule, while consistent with prior practice, needed to be further defined to better carry out the rule’s purpose. In the 1990s, the MPCA convened a task force to examine the impacts of phosphorus on the environment and review how the MPCA regulated phosphorus-related problems through the National Pollutant Discharge Elimination System (NPDES) permitting process. In 1996, the task force issued a report that examined the historic application of the Phosphorus Rule, as well as other issues related to the regulation of phosphorus. In March 2000, the agency adopted a series of policy documents collectively known as the “Phosphorus

<sup>4</sup> See Appendix 1, Minn. R. 7050.0211, subp. 1a (2006).

Strategy,” which addressed the application of the Phosphorus Rule relative to NPDES permits and the cumulative impact of pollutant loadings relative to the 303(d) Impaired Waters List and the Total Maximum Daily Load (TMDL) program.

The Phosphorus Strategy made clear the MPCA’s intent on three key points:

1. Minnesota Department of Natural Resources (MDNR) Bulletin 25<sup>5</sup>, while commonly used as a document to identify lakes and reservoirs in Minnesota, is not dispositive of the issue, particularly with regard to “run of the river” -- like Lake Pepin -- or reservoirs created by lock and dam systems that may act more like rivers than lakes.
2. Hydraulic residence time (“detention time”) is a key determining factor in whether phosphorus will affect algal growth in a river or lake system and, therefore, is a determining factor in whether a given water body should be classified as a lake or reservoir.<sup>6</sup>
3. The MPCA will interpret the term “affects” to mean a measurable impact of an individual facility’s phosphorus discharge on various algal growth response factors in the water body in question, chief among them chlorophyll-a concentrations and turbidity (measured through Secchi disk depth).<sup>7</sup> The MPCA also abandoned the “50-mile rule of thumb” in favor of a more detailed water quality analysis of the effects point-source phosphorus discharges may have on lakes and reservoirs downstream. The change ensured that the significance of the impact, not its distance from the lake, controlled the need to impose phosphorus limitations.

Where cumulative sources were still documented to cause adverse impacts on water quality even after the imposition of limits under the Phosphorus Rule, the Phosphorus Strategy indicated that the TMDL process would resolve those concerns. For streams, given the uncertain and transient nature of phosphorus impacts, the TMDL process is the scientifically defensible approach selected by the MPCA to impose nutrient limitations. Taken together, the documents demonstrate that the Strategy does not amend the Phosphorus Rule but rather provides a guidance framework for applying the existing Phosphorus Rule within a broader structure of nutrient management.

### **c. 2003 Phosphorus Rule petition; detention time and temperature issues**

After the implementation of the Phosphorus Strategy, several contested case petitions were filed attempting to impose a 1 mg/L phosphorus effluent limit pursuant to the rule in various

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<sup>5</sup> Minnesota Conservation Department, “*An Inventory of Minnesota Lakes*” (1968)

<sup>6</sup> As discussed in the Strategy, the MPCA tends not to consider bodies of flowing water with less than 14 days’ detention time to be “lakes or reservoirs” for purposes of the Phosphorus Rule. Phosphorus Strategy at 11-13. Available online at <http://www.pca.state.mn.us/water/pubs/phos-npdes.pdf>

<sup>7</sup> “Phosphorus Strategy: NPDES Permits”, at 2. Available online at <http://www.pca.state.mn.us/water/pubs/phos-npdes.pdf>

municipal facilities' National Pollutant Discharge Elimination System (NPDES) permits.<sup>8</sup> In particular, the following issues regarding the interpretation of the Phosphorus Rule arose in these cases:

1. Whether a body of water in question is a “lake or reservoir” for purposes of the Phosphorus Rule.
2. Whether the MPCA interprets the term “affects” to mean an analysis of the impact of an individual discharger’s phosphorus effluent on algal growth in a lake or reservoir.

In essence, these contested-case petitions challenged MPCA’s authority to reasonably interpret the Phosphorus Rule in accordance with its longstanding practices. In an effort to avoid costly, time consuming and repetitive contested cases, four associations for Minnesota cities<sup>9</sup> petitioned the MPCA to enact rule clarifications consistent with the agency’s adopted policies. The petitioners proposed adding the following language to the Rule: “For purposes of this Rule, ‘lake or reservoir’ means a body of water with an average annual hydraulic residence time exceeding 14 days, and the term ‘affect’ means the measurable impact of an individual facility’s phosphorus discharge on scientifically documented algal growth in a lake or reservoir.” The clarifications<sup>10</sup> were aimed at giving the regulated community, and other interested parties, a clearer understanding of the scope and application of the Phosphorus Rule.

In 2004, the four associations were notified that the MPCA would be proposing far more restrictive changes to the rule as a part of the agency’s triennial review. Among the proposed

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<sup>8</sup> See *Minnesota Center for Environmental Advocacy v. MPCA and City of St. Cloud*, Minn. Ct. App. Case No. C3-03-75 (Jan. 13, 2003); *Minnesota Center for Environmental Advocacy v. MPCA and Cities of Faribault and Owatonna*, Minn. Ct. App. Consolidated Case Nos. A03-331 and A03-333 (Apr. 21, 2003).

<sup>9</sup>The four Minnesota cities’ associations petitioning the MPCA for rulemaking were the Coalition of Greater Minnesota Cities (CGMC), the Minnesota Environmental Science and Economic Review Board (MESERB), the League of Minnesota Cities (LMC), and the Minnesota Association of Small Cities (MAOSC).

<sup>10</sup>**Proposed Rule Amendment (Clarifications Underlined)**

Part 7050.0211, subp. 1a. Total phosphorus effluent limits.

Where the discharge of effluent is directly to or affects a lake or reservoir, phosphorus removal to one milligram per liter shall be required. For purposes of this Rule, “lake or reservoir” means a body of water with an average annual hydraulic residence time exceeding 14 days, and the term “affect” means the measurable impact of an individual facility’s phosphorus discharge on scientifically-documented algal growth in a lake or reservoir. The limit must be a calendar month arithmetic mean unless the Commissioner finds, after considering the criteria listed in items A and B, that a different averaging period is acceptable. In no case shall the one milligram per liter limit exceed a moving mean of 12 monthly values reported on a monthly basis, or a simple mean for a specified period, not to exceed 12 months. Calendar month effluent limits in effect on the effective date of this part must remain in effect unless an assessment of the criteria listed in items A and B indicate a different averaging period is acceptable. A different averaging period is acceptable when:

- A. the effect of the phosphorus loading from the facility on the receiving water or downstream water resources is generally not measurable; and
- B. the treatment technologies being considered offer environmental, financial, or other benefits.

In addition, removal of nutrients from all wastes shall be provided to the fullest practicable extent wherever sources of nutrients are considered to be actually or potentially detrimental to preservation or enhancement of the designated water uses.

changes was the imposition of a 1 mg/L phosphorus effluent limit after January 1, 2006 on any new or expanded discharge of more than 1,800 pounds per year, regardless of whether the discharge actually affects the receiving water. The proposed rule change is a significant departure from the current rule. Under the MPCA proposal, Mississippi River communities below Lake Pepin and communities along the Red River of the North will be required to institute year round phosphorus removal, even though they cause no apparent adverse impacts on water quality,

The associations were convinced that a year-round phosphorus limit would be counter productive. They argued that significant resources would be wasted because water flow plays a significant role in determining the impact of nutrients on algal productivity.<sup>11</sup> During high-flow conditions -- late March to early May -- snowmelt runoff tends to be heavy and bio-available phosphorus from publicly owned wastewater treatment facilities tends to be quickly flushed downstream without causing any adverse impacts to the water body. Pond systems that discharge in the spring and fall may discharge high levels of nutrients, but these too become diluted in high flows. These systems do not discharge at all during low flows in the summer when algal growth potential is significant. The associations argued that given the significant impact of flows on the availability of phosphorus to promote algal growth, effluent limitations on wastewater systems should be keyed to flow conditions, not to a year-round 1 mg/L effluent limit.<sup>12</sup>

A second concern focused on the affect of temperature on excess algae growth. Problem algae tend not to grow to any significant degree in the months when surface waters are frozen (roughly from November through April), despite relatively low flows and possibly high phosphorus concentrations.<sup>13</sup> Ice cover dramatically reduces light needed to support plant growth. Furthermore, the algae that do grow in colder conditions are generally not the same algae that contribute to nuisance blooms, foul taste, odor, and the other unpleasant effects exhibited during the growing season that the Phosphorus Rule was designed to address. The cities, therefore, argued that temperature and seasonal variability should be accounted for when a phosphorus limit is calculated, given the significant local resources involved. That consideration is the common practice when the EPA determines the appropriate nutrient limitations for river systems. The MPCA's approach would waste local resources, increase sludge generation and unnecessarily consume energy without attendant environmental need or benefit.

#### **d. Minn. Laws 2003, Ch. 128, Art. 1, § 156; water quality requirements**

In November of 2000, the CGMC, LMC, MAOSC, and the Minnesota Farm Bureau Federation (MFBF) successfully petitioned the MPCA to go through rulemaking to revise its Water Quality

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<sup>11</sup> Heiskary, Steven and Howard Markus, *Establishing Relationships Among In-stream Nutrient Concentrations, Phytoplankton and Periphyton Abundance and Composition, Fish and Macroinvertebrate Indices, and Biochemical Oxygen Demand in Minnesota USA Rivers* (July 2003), at Table 1, 42 and 83. Available online at <http://www.pca.state.mn.us/publications/reports/biomonitoring-mnriverrelationships.pdf>

<sup>12</sup> MPCA in fact took this very approach in the Minnesota River TMDL where MPCA determined that total phosphorus reduction was only needed during summer months in low flow years.

<sup>13</sup> See Phosphorus Strategy at 8: "It is also important to note that most pond discharges occur seasonally, typically in the spring and fall when the production of nuisance blooms of blue-green algae are not common." Available online at <http://www.pca.state.mn.us/water/pubs/phos-mpdes.pdf>

Assessment Process for Waters of the State (a/k/a the “TMDL Rule”). The MPCA uses Chapter 7050 of the Minnesota Rules, and in particular Minn. R. 7050.0150, to evaluate whether lakes and rivers are “impaired” and should be included on Minnesota’s Section 303(d)<sup>14</sup> Impaired Waters list, which must be submitted to the U.S. Environmental Protection Agency every two years. Federal law requires the development of TMDL’s for waterbodies that are listed as impaired; therefore, the 303(d) list and TMDL’s go hand-in-hand.

The CGMC and MESERB presented extensive written and oral comments to the MPCA expressing their concerns about the TMDL Rule’s cost impact on municipal wastewater treatment systems. MESERB and the CGMC had multiple concerns about the TMDL Rule, including: the use of assumptions that bear little resemblance to reality, failure of the rule to use a “weight of evidence” approach in considering all of the factors listed in the rule; vagueness of key terms like “material increase”, “significantly increase”, and “seriously impaired”, the arbitrary application of the Rule, and MPCA exceeding its statutory authority through the application of the rule.

The Legislature responded by passing Minn. Laws 2003, Ch. 128, Art. 1, § 156 which required the MPCA, as part of its triennial water quality standards review, to conduct rulemaking to define the vague terms in the TMDL Rule. Minn. Laws 2003, Ch. 128, Art. 1, § 156 also requires the following: (1) The MPCA may determine a water to be “impaired” (and therefore go on Minnesota’s 303(d) Impaired Waters list) only if “pollution of the waters of the state has resulted in degradation of the physical, chemical, or biological qualities of the water body to the extent that attainable or previously existing beneficial uses are actually or potentially lost.” (2) The MPCA must initiate an administrative process to undesignate a use for a water body if a person presents adequate information to demonstrate that the use is not attainable because of natural conditions. (3) When the MPCA considers nutrient impairment in river systems, the agency must consider the effects of temperature and hydraulic residence time on algal populations, when the discharge of nutrients is expected to cause or contribute to algal growth that impairs existing or attainable uses.

The overriding intent of the legislation was to provide a framework through which the MPCA would appropriately identify impaired water segments for TMDL development through the application of scientific studies and data to prove need. Furthermore, pertaining to phosphorus and more generally nutrient regulations, the purpose of Minn. Laws 2003, Ch. 128, Art. 1, § 156 was to ensure that phosphorus reduction requirements in riverine situations were only imposed when phosphorus would significantly impact algal growth and adversely impact beneficial uses.

**e. Minn. Laws 2006, Ch. 251, § 16 (Phosphorus Rule moratorium and report)**

Since 2004, the MPCA has been conducting its triennial water quality standards review. A part of this rulemaking process has been to change the Phosphorus Rule to require that a 1 mg/L standard apply to all new and expanding discharges regardless of affect on the receiving water body. Prior to this time, MPCA had been imposing a 1 mg/L limit on plant expansions, even

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<sup>14</sup> 33 USC 1313(d)(1)(A) requires that states compile a list of their impaired waters. This list is put together by each states pollution control agency and sent to the EPA for approval every two years.

though no adopted rule authorized this approach. In 2006, the Minnesota State Legislature passed and the Governor signed into law an amendment to the Clean Water Legacy Act, Minn. Laws 2006, Ch. 251, § 16 that delayed the implementation date of changes to the Phosphorus Rule until July 1, 2007. The amendment also required that the MPCA report to the Legislature by February 1, 2007 on the scientific basis and need for the universal application of the 1 mg/L phosphorous standard.

#### **f. Summary of arguments raised in correspondence between MESERB and MPCA**

MESERB and the MPCA have corresponded at length in regards to the proposed universal 1 mg/L phosphorus standard.<sup>15</sup> MESERB has highlighted for the MPCA its concerns about the rule changes and the MPCA has replied to these concerns. The following is a brief summation of the arguments raised by MESERB against the proposed universal 1 mg/L Phosphorus Rule, MPCA's justifications for their rule changes, and MESERB's current reply to the MPCA's justifications.

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#### **MESERB Argument #1**

The proposed amendments to the Phosphorus Rule will create limits imposed under widely recognized circumstances where no discernible environmental benefit will occur. In fact, the proposed rule will impose phosphorus limits even when these limits are specifically shown to be unnecessary. In some situations, phosphorus is simply not an issue in so far as no downstream waters are affected by the phosphorus discharge, or other environmental factors—flow, temperature, and detention time—prevent phosphorus and other nutrients from impairing the water body. In this context, requiring a 1 mg/L standard will waste an incredible amount of state and local resources. Moreover, the MPCA's failure to account for the circumstances when phosphorus discharges will not cause any material change in algal growth violates the language of Minn. Laws 2003, Ch. 128, Art. 1, § 156.<sup>16</sup>

#### **MPCA Response**

The MPCA maintains that it has data from several rivers and streams around the state that show excess phosphorus increases the abundance of suspended algae in rivers. Furthermore, recent studies have shown impacts from phosphorus discharges where none were assumed in the past.

As home to the headwaters of three major river basins, Minnesota has an obligation to consider the downstream ramifications of its own phosphorus loading. "Hypoxia in the waters off the mouth of the Mississippi River is a well known example."<sup>17</sup>

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<sup>15</sup> See Appendix 2.

<sup>16</sup> See Appendix 4, "[T]he Agency, in considering impairment due to [T]nutrients and application of nutrient objectives and effluent limitations related to riverine systems or riverine impoundments, must consider temperature and detention time effects on algal populations when the discharge of nutrients is expected to cause or contribute to algal growth that impairs existing or attainable uses." Minn. Laws 2003, Ch. 128, Art. 1, Section 156.

<sup>17</sup> See Appendix 2, May 12, 2005 MPCA letter to MESERB President, Bruce Nelson, "Response to MESERB February 11, 2005 letter, comments on amendments to phosphorus rule"; and March 18, 2005 letter, comments on proposed eutrophication standards."

In the main, MPCA believes that moving towards a universal 1 mg/L standard is a precautionary measure to prevent lakes and reservoirs from becoming impaired. “If we wait until a water body is impaired, (internal reference omitted), not only will our surface waters be in much worse condition, but the cost to bring these waterbodies back to health, if possible, is usually far more than the cost of preventive measures.”<sup>18</sup>

The MPCA contends that it will not be in violation of Minn. Laws 2003, Ch. 128, Art. 1, § 156 if it adopts the amendments to the Phosphorus Rule.

### **MESERB Reply**

The MPCA’s response simply does not address MESERB’s concerns. While MESERB agrees that some streams will require nutrient reduction measures, such data does not provide a justification for a position that all streams require nutrient reduction measures. The need to reduce phosphorus during summertime low-flow conditions certainly provides no support for the MPCA position that phosphorus reduction is needed under cold-weather or high-flow conditions. Whether or how nutrient loads from Minnesota impact the Gulf of Mexico is pure speculation and will be addressed by a Federal TMDL action when an appropriate scientific basis for regulation is identified.<sup>19</sup> The MPCA’s assertion that total phosphorus reduction is necessary as a “precautionary measure” is unsupported speculation, and is contrary to existing law. Minn. Laws 2003, Ch. 128, Art. 1, § 156 was adopted to ensure that phosphorus reduction requirements in rivers were only imposed when phosphorus would significantly impact algal growth and adversely impact beneficial uses. That limitation precludes the MPCA from adopting statewide total phosphorus reductions simply as a “precaution” absent some site-specific demonstration of need. If impairment is projected to occur, the MPCA may certainly restrict total phosphorus discharges. The MPCA, however, cannot assume impairments exist.

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### **MESERB Argument #2**

It is well-settled that a 1 mg/L effluent limit is appropriate where a discharge is directly to a lake or reservoir, or is shown to affect a downstream lake or reservoir. The MPCA’s proposed changes to the Phosphorus Rule, however, will impose a 1 mg/L limit on any new or expanded discharge to an impaired water body, regardless of whether the receiving water is a river or a lake and regardless of whether the discharge will “cause or contribute” to the impairment. That is not reasonable or legally defensible. Minn. Laws 2003, Ch. 128, Art. 1, § 156 does not allow this result.

### **MPCA Response**

The MPCA believes that its rulemaking is consistent with the dictates of Minn. Laws 2003, Ch. 128, Art. 1, § 156. The MPCA has broad authority to set effluent limits to prevent the pollution of state waters and to prevent the physical, chemical or biological degradation of receiving waters.

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<sup>18</sup> See Appendix 2, May 12, 2005 MPCA letter to MESERB President, Bruce Nelson, “Response to MESERB February 11, 2005 letter, comments on amendments to phosphorus rule.”

<sup>19</sup> It is well known that hypoxia in the Gulf of Mexico is principally caused by excess nitrogen farm runoff. EPA is developing regulations and guidance that will address nitrogen farm runoff nationwide.

### **MESERB Reply**

The MPCA is simply ignoring MESERB's concerns and the agency's statutory obligations. Applicable federal rules implemented by the MPCA for 20 years only allow the imposition of water quality-based limits where a discharge "causes or contributes" to an impairment. (40 CRF 122.44(d)) Minn. Laws 2003, Ch. 128, Art. 1, § 156 similarly mandates this showing and further mandates that the MPCA "consider temperature and detention time effects on algal populations when the discharge of nutrients is expected to cause or contribute to algal growth that impairs existing or attainable uses." By setting a universal 1 mg/L phosphorus limitation that applies independent of affect, the MPCA can not be considering the effect of water temperature or detention time on algal populations for an individual discharge. In this light, it is clear the MPCA has explicitly contravened the requirements of Minn. Laws 2003, Ch. 128, Art. 1, § 156.

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### **MESERB Argument #3**

A monthly or annual phosphorus effluent limit on a discharge to a river or stream is inappropriate where phosphorus is not an issue due to seasonal variation or where a TMDL specifies phosphorus reductions other than what the Phosphorus Rule would otherwise require.

### **MPCA Response**

River systems are in a constant cycle of scouring, transporting and depositing sediments. The MPCA believes that phosphorus discharged in winter can adhere to particulates that settle to the bottom of river beds and may become available for problem algal growth during the summer months.

The proposed universal 1 mg/L phosphorus standard is consistent and complementary with upcoming and implemented nutrient TMDLs. Moreover, the MPCA has incorporated into the proposed changes to the Phosphorus Rule certain off-ramps,<sup>20</sup> or exceptions, to the universal 1 mg/L phosphorus limit—including the scenario where the imposition of a 1 mg/L limit on a new or expanding facility is more restrictive than the limit called for by a *completed and implemented* TMDL. Because of this, the "rule change will have little or no impact to dischargers in at least four of eight major watersheds in Minnesota."<sup>21</sup>

### **MESERB Reply**

The MPCA's analysis of the issue simply misses the point. Generic statements about nutrient cycling provide no basis to control nutrients that cannot cause significant algal growth in winter and high-flow periods. The MPCA studies that have evaluated stream impacts have generally considered this component to be minor because the factors that promote phosphorus release from sediments do not occur under aerobic conditions prevalent in streams. When the MPCA demonstrates that an upstream load transported to a downstream location causes impairment,

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<sup>20</sup> See Appendix 1, MPCA is referring to Minn. R. 7055.0255, subp. 3 & 4 (Proposed January 1, 2006) which gives dischargers the possibility of seeking an alternative limit. In the main, an alternative limit can be sought if; 1.) A TMDL plan, including the implementation plan, is complete and approved by the EPA at the time the facility is in its planning and design phase. 2.) The environmental harm outweighs the benefit. 3.) The mass of total phosphorus removed is less than 5% of the initial limit. 4.) The facility must move to chemical phosphorus removal and be located within one of three rule specified watersheds.

<sup>21</sup> See Appendix 2, June 29, 2005 MPCA letter to MESERB President, Bruce Nelson, "Re: MESERB's Concerns Regarding Nutrient Standards and Phosphorus Rule."

certainly the agency may regulate that source. The MPCA also glosses over the fact that its rule will trump implemented TMDLs that are developed or implemented *after* a facility is planned and designed. That is a significant point, because a TMDL plan could indicate that phosphorus removal does not need to be year round or at a particular level of stringency. Should this occur, following the TMDL is beneficial because it reduces wastewater operation and maintenance costs, decreases energy usage, and significantly lowers chemical and sludge production for a community. Under the proposed rule, any wastewater treatment facility that was designed or built before a TMDL was implemented would be forced to accept the 1 mg/L standard year round, regardless of what the implemented TMDL determined was necessary to achieve water quality. Because of federal anti-backsliding laws there would be no opportunity for a community to have the TMDL's less strict or non-year-round requirement apply if the 1 mg/L standard applied to it first. The TMDL exception the MPCA created in the proposed rule for communities that are planning and designing wastewater treatment facilities simply does not go far enough to be a meaningful exception.

An analysis of the currently proposed rule indicates that in order to receive an exemption from the 1 mg/L standard, a new or expanding discharger "*may request an alternative limit or no limit.*"<sup>22</sup> In practice, cities will have to petition the MPCA for an exemption to the 1 mg/L standard on the same basis the agency has rejected in considering this rulemaking. Furthermore, the MPCA may decide not to give an exemption, regardless of a city's showing. For all practical purposes, cities are not in a position to contest the MPCA's findings and will be forced to acquiesce to the agency's demands. Most cities simply do not have the resources necessary to pursue claims legal claims against the MPCA.

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<sup>22</sup> See Appendix 1, Minn. R. 7055.0255, subp. 4 (Proposed January 1, 2006).

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## IV. Legal Analysis

### a. Clean Water Act and EPA statute/case law/guidance on phosphorus regulation

Under the Federal Clean Water Act (CWA), every state must establish water quality standards (WQSs) for each body of water within the State's borders.<sup>23</sup> The CWA does not mandate any one particular approach to water quality; instead it requires that all states develop their own water quality standards designed to protect the specific beneficial uses of a water body. These standards are then subject to approval by the Environmental Protection Agency (EPA) administrator, who is authorized to enforce and implement the CWA.<sup>24</sup> Technology-based limitations are only established for "secondary treatment" Biochemical Oxygen Demand (BOD)<sup>25</sup> and Total Suspended Solids (TSS)<sup>26</sup> reduction. Other pollutants (i.e., nutrients) are regulated solely on an as-necessary basis to achieve applicable water quality objectives, under provision 301 and 303 of the Act. Furthermore, the CWA does not ban the discharge of pollutants into waterways that are in violation of state water quality standards.<sup>27</sup> Instead, the CWA "vests in the EPA and the State's broad authority to develop long-range, area-wide programs to alleviate and eliminate existing pollution."<sup>28</sup> CWA Section 303(d) sets forth a planning process under which states are to evaluate waters that do not achieve applicable standards and to establish limitations necessary to achieve the adopted standards.<sup>29</sup> Where a state downstream is adversely impacted by another state, the act establishes a procedure for raising and addressing such concerns. In sum, the CWA sets up a framework for ensuring water quality throughout the states. The CWA gives each state the flexibility to develop plans and utilize tools necessary to achieve this goal, provided these techniques and tools meet baseline requirements as determined by the EPA.

Impaired waters are known as "water quality limited segments" (WQLSs). Under the CWA, states must identify, prioritize, and list those WQLSs for which the technology-based<sup>30</sup> effluent limitations and other required controls are not stringent enough to achieve the applicable water quality standards.<sup>31</sup> The 303(d) list is a tool that identifies pollutants that are likely affecting a water body (i.e., phosphorus, mercury, bioaccumulatives, sediment, etc.) and causing a violation of the water quality standards, which requires further evaluation.<sup>32</sup> The list does not establish any regulatory requirements; rather it is a process under which evaluations occur.<sup>33</sup> The 303(d)

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<sup>23</sup> 33 U.S.C. § 1313(a)-(c).

<sup>24</sup> 33 U.S.C. § 1313(a).

<sup>25</sup> Biochemical Oxygen Demand is an important measure of water quality.

<sup>26</sup> Total Suspended Solids (TSS) reduction is a common phosphorus removal technique.

<sup>27</sup> *Arkansas v. Oklahoma*, 503 U.S. 91, 109 (1992).

<sup>28</sup> *Id.*; 33 U.S.C. § 1288(b)(2).

<sup>29</sup> *Arkansas v. Oklahoma*, 503 U.S. 91, 101 (1992).

<sup>30</sup> See Footnote 45 for detailed explanation of technology-based effluent limitations.

<sup>31</sup> 33 U.S.C. § 1313(d)(1)(A); 40 C.F.R. § 130.0(e) (describing the iterative nature of the 303(d) process).

<sup>32</sup> *Missouri Soybean Ass'n v. Missouri Clean Water Comm'n*, 102 S.W.3d 10, 16 (D. Mo. 2003); 40 C.F.R. § 130.7.

<sup>33</sup> *Id.*

list must be submitted to the EPA for its approval.<sup>34</sup> States must then update and revise these lists every two years.<sup>35</sup>

For each WQLS on the 303(d) list confirmed to be impaired, the State must establish a TMDL so that standards are met and water quality is restored.<sup>36</sup> TMDLs set the quantity of a pollutant that may be introduced into a receiving water without exceeding applicable water quality standards, taking into account seasonal variations and an adequate margin of safety.<sup>37</sup>

A TMDL is the “sum of the individual [wasteload allocations (“WLAs”)] for point sources and [load allocations (“LAs”)] for non-point sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any non-point sources of pollution and natural background sources, tributaries, or adjacent segments.”<sup>38</sup> These approved loadings are incorporated into the state’s water quality management (“WQM”) plans and NPDES permits.<sup>39</sup> The TMDL may allocate load reduction responsibilities in any manner that will ensure water quality standards compliance.<sup>40</sup>

Thus, federal law does not establish minimum nutrient reduction requirements, such as a 1 mg/L phosphorus limitation. Such a requirement may only be imposed on a demonstration of need for ensuring achievement of applicable water-quality objectives.

#### **b. Applicable Federal guidance on phosphorus regulation**

The EPA has issued considerable guidance on the appropriate regulation of nutrients to both lake and river systems.<sup>41</sup> The guidance recommends the adoption of instream nutrient targets in conjunction with “response criteria” – those water quality indicators that confirm excessive plant growth is occurring (chlorophyll ‘a’, turbidity, secchi depth). The MPCA has initiated rulemaking activities for adoption of such standards for different classes and categories of lakes.

For rivers, the EPA does not recommend the same approach, since river responses to nutrient inputs are so variable. In general, the EPA recommends that nutrient decisions for river systems be tied to other established water quality parameters (such as dissolved oxygen). The EPA also recommends that states seek to establish appropriate use-impairment objectives for plant growth, similar to those long recognized for lakes, once such information is available. EPA documents observe that regulating certain types of plant growth in streams may be extremely difficult or accomplished by means other than nutrient load reduction. For example, macrophytes (rooted plants) may not be impacted by overlying water column concentrations of nutrients as they receive nutrients through the soil matrix. Likewise, periphyton – attached algae – may be able to grow to high levels given phosphorus presence in most natural settings – so long as adequate

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<sup>34</sup> 33 U.S.C. § 1313(d)(2).

<sup>35</sup> 40 C.F.R. § 130.7(b)(1).

<sup>36</sup> *Missouri Soybean Ass’n*, 102 S.W.3d at 16; 33 U.S.C. § 1313(d)(1)(C); 40 C.F.R. § 130.7(c)(1).

<sup>37</sup> 33 U.S.C. § 1313(d)(1)(C).

<sup>38</sup> 40 C.F.R. § 130.2(i).

<sup>39</sup> 40 C.F.R. § 130.7(a).

<sup>40</sup> 40 C.F.R. § 130.2(i).

<sup>41</sup> *Nutrient Criteria Technical Guidance Manual: Rivers and Streams* US EPA July 2000.  
<http://www.epa.gov/waterscience/criteria/nutrient/guidance/rivers/index.html>.

light is present. Thus, improvement in tree canopy may be the only viable solution to addressing such plant growth. For large flowing waters where algae are the main component (such as on the Minnesota River) traditional approaches to excessive plant growth are expected to be effective as these plants respond similarly to those growing in lakes.

Given the wide range of circumstances occurring in streams, the EPA does not recommend that any specific nutrient limitations be imposed pending the completion of necessary water quality studies.<sup>42</sup> Most EPA issued permits contain re-opener clauses that allow for the imposition of appropriate limitations once established. In situations where the nutrient impairment from a point source is apparent, however, some type of interim reductions are suggested and supported by the EPA.

### **c. MPCA legal basis for phosphorus regulation**

Minn. Stat. § 115.03, subs. 1 and 5 (2006) and 40 C.F.R. § 123.25(a)(1) (2006) give the MPCA authority to implement any state or federal law regulating water quality. The MPCA's authority to govern the discharge of phosphorus originates from the Phosphorus Rule codified at Minn. Rule. 7050.0211 (2006) and the 2003 State statute adopted regarding development of appropriate nutrient reduction requirements and standards.

### **d. Inconsistency of new universal 1 mg/L phosphorus effluent standard with the current Phosphorus Rule**

For river dischargers, MPCA's current Phosphorus Rule is an effect-based, site-specific analysis that looks at the unique needs and capacities of a water body when determining an effluent standard for new and expanding dischargers. By moving forward with the current rulemaking, the MPCA signals its intention to abandon this approach in favor of an arbitrary one-size-fits-all Phosphorus Rule. By moving away from a site-specific analysis, the MPCA will be setting phosphorus effluent limits for publicly owned wastewater treatment facilities (WWTFs) independent of scientific and legal basis and under circumstances that are generally accepted in the scientific community as not necessary to protect water quality. Unlike the current rule, this will lead to an unnecessary expenditure of local and state resources that in many instances will have little or no impact on water quality throughout Minnesota.

Unlike the current Phosphorus Rule, the new universal 1 mg/L phosphorus effluent limit ignores the existing legislative directive to ensure that nutrient regulation appropriately considers both the effects of temperature and detention time on the need to regulate nutrients. This is significant, since it is universally accepted that flow has a major influence on whether or not a discharge will cause impairment of a water body. For this reason, federal rules mandate that flow be considered when setting water quality-based limits. Under the current Phosphorus Rule, the MPCA has the authority and responsibility to consider the effects of flow. Additionally, the MPCA will be giving up its authority to use hydraulic residence time to distinguish lakes and reservoirs from rivers and streams.

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<sup>42</sup> In 1999 and 2000, the EPA specifically considered and rejected establishing a Federal rule that would require the imposition of any water quality-based limitation pending completion of a TMDL or other appropriate water quality analysis.

Secondly, the arbitrary application of the universal 1 mg/L standard ignores the impact of temperature and seasonality on algal growth. A 1 mg/L effluent standard should be restricted to low-flow situations and to the May-September growing season when temperature is sufficient to support problem algae's utilization of available phosphorus.

By adopting a statewide 1 mg/L phosphorus limit for all discharges, the MPCA will be restricting its authority to consider light limitation and phosphorus impacts on river systems, influences the scientific community has long identified as controlling plant growth.

#### **e. Summary of approaches used by other state pollution control authorities**

Phosphorus impairments are dealt with by states in a variety of ways. Minnesota House Research has prepared an extensive table that lists a number of approaches used by selected states and a Canadian province for controlling phosphorus.<sup>43</sup>

There are two categories of regulatory approaches used by the states to limit phosphorus: (1) individual water quality impacts analyses based upon scientifically defensible studies; and (2) the imposition of statewide limits which are made more restrictive upon the demonstration of site-specific need. The first approach is a strict water quality-based approach;<sup>44</sup> the latter is a combined technology-based<sup>45</sup>/water quality-based approach. Water quality-based approaches ensure that local resources are expended only where demonstrable environmental improvement can occur. Technology-based approaches operate independently from any demonstrable improvement or need. For example, Wisconsin in 1992 adopted a 1.0 milligram per liter phosphorus discharge limit<sup>46</sup> similar to that currently proposed by the MPCA. Wisconsin has yet to produce a report demonstrating that this action resulted in any demonstrable improvement in reducing instream plant growth statewide. Similarly, Georgia has adopted a 0.30 milligram per liter standard for any discharge requiring a permit of more than 3 million gallons of water per day. Florida has taken a similar but slightly different approach to limiting phosphorus discharges by placing the numeric requirement not on the discharge itself, but on the body of water. The basic similarity between these approaches is that an actual numeric standard is applied either to the discharge itself or to the body of water, and the wastewater operator must perform to that particular level. This is the essence of a technology-based approach, because the number is not tagged to any demonstrable increase in water quality – rather it is simply the limit of our technological ability to capture phosphorus.

Another option to limiting phosphorus is the targeted removal or reduction of phosphorus before it becomes a point or non-point source issue. Rhode Island has prohibited the sale of cleaning

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<sup>43</sup> See Appendix 3, “*Selected State Legislation and Phosphorus Reduction Efforts*”

<sup>44</sup> A “Water Quality” based approach to limiting phosphorus looks first to the type of use a water body must be able to attain. For instance, if people must be able to swim in a water body all discharges affecting the water must be set at the point that ensures this classification of water quality. See MPCA’s website on Water Quality Standards for a more thorough review. <http://www.pca.state.mn.us/water/standards/index.html#nnstandards>.

<sup>45</sup> A “Technology-Based” approach to limiting phosphorus looks only at the best available capture technology at the time. A “Technology-Based” approach is independent of any attainable or necessary human or natural use of the water body.

<sup>46</sup> WIS. ADMIN. CODE § 217.

products containing more than a certain percentage of phosphorus. Virginia has placed an outright ban, with exceptions, on the sale of household or industrial cleaning products that contain phosphorus. Other states encourage phosphorus reduction through tax credits, cost-sharing programs or state grants. These programs often target non-point and point source phosphorus dischargers.

Fundamentally, a state must decide how to balance phosphorus discharges into its waterbodies with the most cost-effective means to achieving water quality. One-size-fits-all phosphorus effluent limits—similar to what the MPCA is proposing—are the least cost-effective methods of addressing potential nutrient impacts, because they do not focus on the source of the nutrient problem.

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## V. Public Policy Concerns

There are a number of public policy issues concerning why an automatic phosphorus effluent limit for any new or expanding discharges is inappropriate. In general, publicly owned wastewater treatment facilities (WWTFs) implementing phosphorus reduction requirements incur significant costs, including the costs of modifications and constructing new building, buying chemical additives, producing biosolids, and extra energy costs. It is neither practical nor appropriate to require WWTFs to incur these extra costs to meet a year-round 1 mg/L limit, during times of year when conditions are not amenable to nuisance algal growth and when less costly and/or less intrusive phosphorus reduction methods are available.

Local governments have been saddled with an increasing number of mandates.<sup>47</sup> Tight state budgets over the last several years have led to funding cuts for state agencies and local governments. The mandates, however, have not shrunk accordingly.

Requiring a 1 mg/L effluent limit as part of a new facility or upgrade can result in significant changes to project plans and substantial increases in project costs. Where a receiving water nutrient problem is evident and a site-specific analysis shows that WWTF phosphorus controls will help remediate the condition, objections to the additional costs are likely to be minimal or nonexistent. Clearly, effluent limits are justified in some circumstances. Given the limited resources of local governments, however, they should be focused where they will provide the most significant environmental benefits.

Imposition of a limit on a discharge categorized as “new” or “expanding” without any sort of site-specific analysis places the MPCA and local governments in the position of trying to explain to taxpayers the reasoning behind substantial increases in utility rates and/or property taxes when independent analysis and scientific fact indicate that phosphorus limits are not measurably improving the quality of the receiving water. General responses such as “because it will improve water quality” or “because Wisconsin does it” are not explanations founded upon reasoned, scientifically-supported judgments, but are mere conjecture.

Phosphorus removal has its own environmental costs that must be considered.

Chemical phosphorus treatment increases biosolids production by an estimated 20-40 percent. Given Minnesota’s harsh winter climate, these biosolids must be stored during a significant portion of the year—necessitating additional tankage—and then disposed of, usually through application to farmland.

While land application generally is superior to other disposal options such as incineration and land filling, it has limitations. Over time, urban growth and the declining farming population puts the availability of farmland for this purpose at risk of decline. As an

**General responses such as “because it will improve water quality” or “because Wisconsin does it” are not explanations founded upon reasoned, scientifically-supported judgments.**

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<sup>47</sup> See *e.g.*, Office of the Legislative Auditor, *State Mandates on Local Governments* (January 26, 2000).

element, phosphorus does not break down. Phosphorus that is not used by plant life or leached into the soil runs off with rain or snowmelt, often right back into surface waters. Restrictions on phosphorus content in land-applied biosolids further limits WWTFs' disposal options and leaves incineration and land filling as the only practical alternatives. It is troubling to think that a municipality may spend millions of dollars to converting convert phosphorus from a point source problem into a non-point source problem. Any consideration of phosphorus effluent regulation should take these facts into consideration, as well as the additional regulatory actions that may be triggered as a result of such actions.

The MPCA's proposed approach discourages development of more effective and less costly phosphorus reduction techniques—some of which do not even require treatment modifications. The City of St. Cloud, for example, has used a combination of biological treatment and an aggressive phosphorus management plan to generate some truly impressive effluent reductions over the past several years.<sup>48</sup> A significant part of the city's success is attributable to educating residents about the effects of phosphorus fertilizers and cleaning products, and assisting businesses with switching to phosphorus-free cleansers and recapturing phosphorus-based solvents. With a 1 mg/L effluent limit, there is the added potential of permit violations. To avoid this liability, a typical city would be forced to spend the money—in some cases unnecessarily—for treatment modifications and pass the cost along to taxpayers. This quashes the incentive to employ more creative, cost-effective reduction techniques that may result in significant environmental benefits without the negatives (chemicals, biosolids) associated with mandated treatment to achieve a 1 mg/L limit consistently.

The recommended approach turns the Phosphorus Rule into a standard based solely on technology—not water quality—by de-linking WWTF phosphorus inputs from site-specific water-quality impacts. There is nothing “special” about a 1 mg/L effluent standard, other than the conventional wisdom that decades ago this concentration was deemed to be technologically feasible. Advances in chemical and biological phosphorus removal technologies have enabled some WWTFs to achieve concentrations below 1 mg/L, but even these achievements are tempered by net impacts on receiving water quality, normal variability in removal efficiency, and treatment cost. The imposition by administrative fiat of a highly restrictive effluent limit sandwiches legal and financial liability on top of these other factors.

These issues underlie publicly owned WWTFs' preference for site-specific analytical approaches to effluent limitations, such as the TMDL framework, since they are based on collection of data and scientific analysis to justify costly limits. While not a panacea, the TMDL certainly does provide the opportunity for a far superior—and more supportable—scientific link between water quality issues and NPDES permit enforcement than would an effluent limit triggered simply by a new or expanding WWTF. The proposed automatic limit seems to make such decisions more about administrative ease and reducing the MPCA's burden to use proper science—a clearly inappropriate approach.

All these considerations make a convincing argument that one size does not—indeed, cannot fit all. While the MPCA's proposed approach would be administratively simple, the simple

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<sup>48</sup> *Detailed Assessment of Phosphorus Sources to Minnesota Watersheds*—Executive Summary at xxv. Executive Summary available at <http://www.pca.state.mn.us/publications/reports/pstudy-executivesummary.pdf>

approach is not always right or appropriate. Current law does allow consideration of a variety of factors and circumstances in setting permit requirements. That flexibility should be maintained or expanded to be consistent with our original rulemaking petition and in light of the recent Court of Appeals and ALJ's decisions in the St. Cloud NPDES permit contested case. It allows WWTFs to implement phosphorus management plans that balance the need for clean waters with available technology and funding. A rigid limit works directly against this common-sense approach. It ignores the need for balance, ignores site-specific issues, removes flexibility in permitting, and circumvents the MPCA's current TMDL process, which is designed to collect data and set appropriate permit limit requirements.

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## VI. Critique of MPCA's Phosphorus Rule: Report to the Legislature

On March 8, 2007, MPCA released "*Phosphorus Rule: Report to the Legislature*" (hereinafter referred to as "the report"). By law the report was due on February 1, 2007 and was required to address the scientific justification for the proposed phosphorus rule and the impact the rule would have on Clean Water Legacy funding. MESERB's review of the report has shown that MPCA shed no new light on the scientific rationale for the proposed rule change nor demonstrated that significant benefits were expected to result from the costly proposal. The following is a point by point critique of the report.

### a. The report fails to address the scientific rationale for the proposed statewide 1 milligram per liter phosphorus rule

The question the MPCA failed to answer is why a universal 1 mg/L statewide rule is needed when all the research available indicates that individual dissolved oxygen impairments are created through the interaction of many variables. This is because algae need five things to grow: (1) Water (2) Light (3) Heat (4) Nutrients (like phosphorus) and (5) Time. If any one of these conditions is not present, algae will not grow to a level of concern and no dissolved oxygen impairment will be created. Extensive research has shown that in river systems, high rates of flow, turbidity, and tree canopy (lack of sunlight) often eliminate the ability of these conditions to generate dissolved oxygen impairments. Therefore, any appropriately tailored phosphorus rule should consider the physical characteristics of the setting for each permitted discharge rather than simply relying on an arbitrary nutrient limit. To not do so would waste local and state resources in the treatment of a problem that does not exist.

On page 14 of the report, the MPCA argues against this MESERB position by stating:

"[a] common misconception is that, while nutrients (i.e. phosphorus) may be present in relatively high concentrations in moving water systems, because the water is moving there is not enough time for the plant community to 'take advantage' of the extra nutrients; and that most of the TP load is flushed out and moved harmlessly downstream. Aquatic scientists have reported for decades that nutrients impact rivers and streams. (citation omitted) But until recently these impacts have gone largely undocumented, at least by governmental water quality monitoring programs. The increased nutrient and biological monitoring of rivers and streams by the Agency, other states and federal agencies is providing new documentation of negative impacts of nutrients on rivers and streams.

The Agency has nutrient and algal abundance data from several rivers and streams around the state that show excess phosphorus increases the abundance of suspended algae in rivers. Recent studies and monitoring data on river systems consistently show negative impacts from nutrients where in the past it might have

been assumed impacts would be negligible. In one case, the lower Minnesota River, excess phosphorus and very abundant algae have caused dissolved oxygen levels to fall below standards. This led to the Minnesota River being listed as impaired due to nutrients and the subsequent TMDL....”

Although this appears to be a response, there is nothing substantive about the statement. None of the newly acquired information the MPCA refers to indicates that a phosphorus limit to a river or stream, that does not affect a lake, needs to be year round. In fact, the Lower Minnesota River TMDL cited by the MPCA actually calls for a seasonal—growing season only—1 mg/L standard. Ironically, MPCA’s proposed rule will actually trump the site specific and scientifically vetted Lower Minnesota River TMDL. (See discussion of rule exceptions for a more complete explanation). Moreover, the research cited by MPCA actually confirms that the physical characteristics of a river or stream must be considered. Consistent with MESERB’s concerns, the MPCA only reports that a few monitored streams have confirmed excessive algal growth, not *all monitored streams*. Phosphorus impairment is clearly not a universal problem. The MPCA provides no information showing that it is inappropriate to first confirm whether or not algal growth is excessive before imposing nutrient removal requirements on wastewater discharges.

Furthermore, on page 15 of the report, MPCA states: “Algal growth does not cease during the winter season. While most assessments on river trophic conditions focus on warmer seasons, algal growth can also be excessive in winter.” It is true that there will be a very small amount of algal growth during the winter months in a river or stream, just as there is a small amount of grass growth in a yard during winter. There are, however, no impairments created or perpetuated in the winter months because there is not sufficient sunlight or temperature to create the conditions necessary for excessive algal growth. No study or research project has refuted this fact, and the MPCA cannot cite to any example to validate their claim that year round phosphorus removal is necessary to protect the environment.

Finally, on page 16 of the report, the MPCA states that “the load of nitrogen and phosphorus from the Minnesota River contributes to the hypoxia problem (a large zone of low oxygen levels commonly referred to as the “Dead Zone”) far downstream in the coastal waters off the mouth of the Mississippi River.” The MPCA is simply wrong when it states that phosphorus is a cause of hypoxia in the Gulf of Mexico. Nitrogen from farm field runoff is the nutrient that causes the area of hypoxia in the Gulf. Phosphorus from Minnesota does not cause or even contribute to this problem. In fact, the bulk of phosphorus discharged in Minnesota ultimately does make its way to the Gulf of Mexico, and the amount that does mixes with **naturally occurring unlimited** levels of phosphorus in the deep ocean.

It is also important to keep Minnesota’s contribution to the Mississippi River Gulf of Mexico discharge in perspective. The two main tributary rivers, the Missouri and Ohio, dwarf Minnesota’s contribution to the total discharge at the delta. In real terms, less than point two percent (0.2%) of the water discharged into the Gulf of Mexico carries phosphorus from permitted point sources in Minnesota. Given the natural cycling of nitrogen into nitrogen gas

(which accounts for 79% of our atmosphere), it is uncertain whether any nitrogen from Minnesota actually reaches the Gulf of Mexico.

### **b. Proposed Phosphorus Rule Off Ramps**

The report devotes a significant amount of attention to the proposed Phosphorus Rule off ramps. On page 68, the report states:

“It is our (MPCA’s) belief that the three proposed off ramps, plus the variance option, can adequately address the anticipated variety of situations—that they are broad enough to apply to a wide range of individual situations. It is impossible to anticipate every scenario that might warrant an alternative limit or no limit. In this situation it is appropriate to provide enough flexibility in the rule language to accommodate the inevitable unforeseen situations.”

According to the MPCA, three circumstances are subject to a potential “off ramp”:

- (1) Where an approved nutrient TMDL with an implementation plan has been completed and the facility has not completed its facility design;
- (2) The environmental harm of meeting the limit outweighs the benefit of meeting the limit;
- (3) A seasonal limit may be granted for dischargers to the Lower Mississippi River, below Lake Pepin, the Red and Bois de Sioux Rivers, and the Missouri River, Cedar and Des Moines Rivers, so long as chemical addition must be used to achieve a 1 mg/L limit.

MESERB has determined that each of these “off ramps” have significant problems and will fail to provide relief, even where it is clearly demonstrated that phosphorus-related nutrient impairments do not exist. The following summarizes MESERB’s concerns pertaining to each off ramp:

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#### **Completed TMDL Off Ramp:**

The MPCA’s report notes that the agency considered and rejected the concept that a TMDL would automatically control the appropriate nutrient limits for the discharge (MPCA Report, page 25). Despite the availability of a “nutrient related” TMDL for the Minnesota River providing for only seasonal (June-September) nutrient reduction to a 1 mg/L level, the MPCA has repeatedly issued permits, over the objection of permittees, with a year round 1 mg/L limit (MPCA Report, page 73). This approach directly conflicts with the TMDLs findings that nutrient reduction during the winter and high flow periods was not necessary to achieve dissolved oxygen objectives.

Experience has shown that the MPCA will not respect its own TMDL findings when plant expansions are involved. Communities should not have to petition to avoid an unnecessarily

stringent limitation where the MPCA has already determined through a detailed scientific process that such a limitation is not required. As specified in federal law, permits must be written consistent with an adopted TMDL, 40 C.F.R. § 122.44(d)(1)(vii). Imposing water quality-based limitations when the TMDL plainly concludes such limitations are not needed, directly conflicts with federal law and turns the TMDL process into a sham proceeding.

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**Environmental Harm Off-Ramp:**

No relief is expected from the “environmental harm” off-ramp. MPCA has already rejected the technical submissions of MESERB and the Coalition of Greater Minnesota Cities (CGMC) that phosphorus removal is not required under winter and high flow conditions. MESERB’s position is supported by USEPA guidance (USEPA “Protocol for Developing Nutrient TMDLs –First Edition”, November 1999) and the MPCA’s own conclusions regarding the Lower Minnesota River TMDL, which shows that phosphorus removal for streams is not necessary during high flow (i.e., low detention time) or during the non-algal growing season.

Implementation of seasonal limitations is the standard approach used by EPA when it generates a nutrient TMDL for a stream because of the well-recognized fact that temperature, not nutrient levels will control [plant growth during low temperature/reduced light conditions]. Because the MPCA has already considered the primary situations when nutrient reduction to streams will have no discernable benefit—winter discharges and high flow conditions—there is no reason to believe that the MPCA will consider granting a petition for relief based upon such information.

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**River System Specific Off-Ramp:**

This provision is completely unworkable. The provision requires the community to prove that chemical nutrient removal is the only option available to remove phosphorus. That is an impossible task, since any community with enough money could design and construct a system using biological nutrient reduction. Even dischargers to the Red River and Lower Mississippi River that are clearly not causing nutrient impairment will receive stringent nutrient limitations, though it is apparent that those waters are not suffering excessive algal growth.

MESERB’s analysis indicates that the three “off-ramps” are expected to provide no real relief from unnecessary and wasteful nutrient reduction requirements. Quite simply, they will not be used because, among other reasons, the process is too expensive, too cumbersome, and quite possibly, too much of a gamble for cities to undertake the risk.

The report has also made clear that granting exemptions will not be “automatic” and petitions must be filed to obtain relief, even where the MPCA has issued a scientifically based TMDL and determined nutrient reductions are not necessary. Thus, granting relief is entirely discretionary and will subject communities to additional data collection costs despite clear evidence that no nutrient related problem is associated with their discharge of phosphorus. In other words, these “off-ramps” are expected to provide no real relief from unnecessary and wasteful nutrient reduction requirements.

In conclusion, Section 14.002 of Minnesota State Statutes directs state agencies to promulgate rules that are not overly prescriptive or inflexible.<sup>49</sup> The purpose of which is to prevent waste of local and state resources. Lacking meaningful off-ramps, the MPCA's proposed Phosphorus Rule is precisely the type of rule prohibited by state law.

**c. Benefits of rule will be intangible and expected improvements will go unnoticed**

On page 31 of the report, MPCA indicates:

“The benefits will be largely intangible, and the expected improvements in water quality are likely to go unnoticed by most Minnesotans. Reduced loading of TP from point sources should reduce the growth of attached algae in streams and rivers, and suspended algae in large rivers, and it could improve dissolved oxygen conditions in rivers already impacted by excess nutrients.”<sup>50</sup>

Further down the same page, the Agency estimates that:

“A conservative or high estimate of the total capital and total annual operation and maintenance (O&M) costs (i.e., annual O&M costs for five years) for 35 POTWs in a range of sizes, projected to be impacted by the proposed change to the TP limit over the next five years, is estimated to be about \$134 million.”<sup>51</sup>

MESERB is very concerned about these two statements insofar as they indicate MPCA's disregard for the impact of the proposed rule on municipal budgets and the agency's reluctance to tell the regulated community what the quantifiable benefits of this strategy will be. In short, the MPCA estimates that the rule could cost 35 communities up to \$134 million over the next five years, and the agency admits the benefits of this strategy will be largely intangible and go unnoticed. This is important because people notice dissolved oxygen and excessive plant growth impairments! The hallmarks are dead fish, smelly decaying algae, and green water. Since the rule will, by MPCA's own admission, probably not lead to any tangible results, it has been clear to MESERB from the outset that the Agency is in violation of Minnesota the state law that requires “state agencies must develop rules and regulatory programs that emphasize superior achievement.”<sup>52</sup> The obvious alternative to this ill-conceived program is to target nutrient reduction requirements and treatment levels to situations where environmental benefits need to be and will be achieved. This approach, unlike the MPCA's one-size-fits-all nutrient strategy, will avoid wasting resources and produce environmental benefits for the citizens of Minnesota.

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<sup>49</sup> Minn. Stat. § 14.002 (2006).

<sup>50</sup> *Phosphorus Rule: Report to the Legislature*, February 2007—Page 31.

<sup>51</sup> *Phosphorus Rule: Report to the Legislature*, February 2007—Page 31.

<sup>52</sup> Minn. Stat. § 14.002 (2006).

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## VII. Conclusions

### a. Summary and Critique

The MPCA's current regulatory approach to nutrients imposes phosphorus reduction requirements when there is a likelihood of adverse environmental impacts. The original phosphorus rule and the subsequent phosphorus strategy are based on that regulatory methodology. It parallels federal law and is scientifically defensible, because it does not require unnecessary nutrient reductions.

The MPCA's proposed changes to the Phosphorus Rule, however, will impose a statewide phosphorus reduction requirement on all new and expanding discharges, regardless of their affect on a water body. MESERB is worried about the MPCA's proposed rule because it will impose new phosphorus limits in areas where they are clearly not needed and will lead to absolutely no improvement in water quality. The new phosphorous rule will result in the waste of substantial state and local resources. It will cause greater energy consumption and sludge production during periods when nutrient-related problems are not occurring in the water body.

The MPCA must resolve the state's problem with nutrient impaired public waters, but the proposed change to the Phosphorus Rule is not the most efficient or effective way to achieve that goal. Instead, the MPCA should look to link load-reduction measures with impairment determinations, as they have been doing for more than 30 years. This approach avoids the costly and potentially harmful environmental operation of nutrient reduction during periods when plant growth is minimal or not otherwise a concern. With respect to phosphorus, the state's impairment problems have not been caused by a faulty regulatory methodology. MESERB believes that both the environment and public finances will benefit from continuing to address phosphorus regulation under the current regulation for discharging phosphorous.

### b. Proposed Legislative Action

Since the MPCA's changes to the Phosphorus Rule have been delayed until May 1, 2008, MESERB, the CGMC and the LMC propose the attached statutory language.<sup>53</sup> If the Legislature passes this language, it will prevent the MPCA from adopting a universal 1 mg/L phosphorus limit for all dischargers regardless of affect. The proposed language would not change any other portion of the MPCA's triennial water quality standards review. If adopted the language would simply require the MPCA to keep its current effects-based Phosphorus Rule.

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<sup>53</sup> See Appendix 4, H.F. 1520 (Dill) (as introduced)/S.F. 1435 (Langseth) (as introduced)

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