Friends of the Mississippi River

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November 1st, 2013

Annie Felix-Gerth
Pesticide and Fertilizer Management Division
Minnesota Department of Agriculture
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Dear Mrs. Felix-Gerth,

I am writing on behalf of Friends of the Mississippi River and our members with comments on the proposed 2013 Minnesota Nitrogen Fertilizer Management Plan now open for public comment.

Friends of the Mississippi River (FMR) is a non-profit organization founded in 1993 with a mission to protect, preserve and enhance the Mississippi River and its watershed in the Twin Cities metro area and beyond. With over 1,600 members, 16 active board members, and 18 staff - FMR is a leading citizen organization working to protect and enhance the Mississippi River and its watershed.

Nitrate Pollution in Minnesota
As demonstrated by the Minnesota Pollution Control Agency's "Nitrogen in Minnesota Surface Waters" study, a significant portion (73%) of nitrate pollution to Minnesota's surface waters is from agricultural pollution. A full 30% of nitrate contamination to surface waters is agricultural pollution to shallow groundwater that eventually makes its way to surface waters. Not surprisingly, groundwater contamination has increased in six out the state's seven regions over the last decade. In addition, 27% of Minnesota streams exceed 10mg/l concentrations for nitrate, and more than 40% exceed 5mg/l. Approximately 211 million pounds of excess nitrate flows downstream through the Mississippi River watershed annually from Minnesota.

The MPCA's Draft Nitrogen Reduction Strategy includes interim nitrate pollution reduction goals of 20% by 2025 and 45% by 2045. The achievement of these goals, along with efforts to protect groundwater resources in Minnesota, will require significant changes to on-the-ground agricultural practices across the state, including those influenced by the Nitrogen Fertilizer Management Plan.

2013 Minnesota Nitrogen Fertilizer Management Plan (NFMP) Development Process & Timeline
FMR commends the MDA for its efforts to update this plan. It is our understanding that the current NFMP was adopted in 1990. As a result, an update the plan is clearly long overdue.

> Comment: Minnesotans deserve to know that Nitrogen Fertilizer Management Plan will be revised and updated periodically, to reflect advances in technology, agriculture, and water resource sciences in Minnesota.

Recommendation: The MDA should commit to updating the Minnesota Nitrogen Fertilizer Management Plan on a 10-year cycle. Ten year planning horizons are common for many water quality-related planning efforts at the state, watershed, county, and municipal level.

2013 Minnesota Nitrogen Fertilizer Management Plan (NFMP) Concerns

There are several aspects of the draft NFMP plan that do not meet the goals of the 1989 Comprehensive Groundwater Protection Act. As a result, we ask that the MDA revise the NFMP to address these shortcomings.

In general, we have questions or concerns about the following:

1. Reliance on University of Minnesota Extension BMPs.
2. Phase determination criteria.
3. Mitigation activities.
4. Nitrogen Fertilizer Education and Promotion Team (NFEPT).
5. Coordination & prevention efforts.

1. University of Minnesota BMPs for Nitrogen Use in Minnesota

Information provided by the MDA's Bruce Montgomery during his October 16th, 2013 presentation at the Minnesota Water Resources Conference emphasized that the MDA plans to rely extensively on nitrogen reductions derived from the widespread adoption of University of Minnesota Extension Best Management Practices (BMPs).

The NFMP itself includes multiple references to this approach. Examples from the text include:

- Page 40: *"BMPs are the basis for the Nitrogen Fertilizer Management Plan's Prevention Strategy."*

- Page 68: *"The Minnesota Department of Agriculture (MDA) will work with various partners to educate and promote Best Management Practices (BMPs) for general nitrogen fertilizer use. The adoption of BMPs is designed to prevent or mitigate degradation of groundwater."*

- Page 69: *"The objective of education and promotion in the NFMP is for crop producers to use nitrogen fertilizer BMPs to the fullest extent practicable for their given operation."*

This is a fundamentally flawed approach that is highly unlikely to result in meaningful protection of the state's groundwater.

The University of Minnesota Extension Best Management Practices for Nitrogen Use in Minnesota emphasizes that regional BMP recommendations are not designed to meet environmental protection or restoration goals. The University of Minnesota Extension clearly states that the use of BMPs suggested in regional bulletins **increases the probability of obtaining the most economic yield** for the optimum N rate – even if that nitrogen fertilizer application rate results in excess pollution.

The NFMP acknowledges as much on Page 37, stating the following:

> *" It is important to note that there will almost always be some level of nitrate losses under row crop production regardless of nitrogen rate inputs…**losses frequently increase 10-20% when using the optimum nitrogen rate.**"*

For example, page 3 of the University of Minnesota Extension Best Management Practices for Nitrogen Use in South-Central Minnesota states that "Maximum Economic Return to N" (MRTN) rates are used to

determine economically optimal fertilizer application rates. In the example used, the MRTN rate was found to be spring-applied at 120-lb/acre.

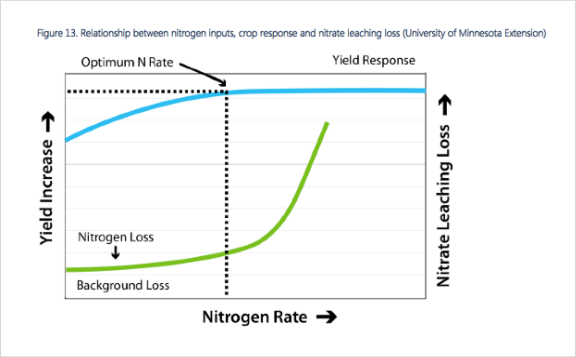
> *"Greatest yield and profit with a minimal increase in NO_3-N concentration was found with the spring-applied 120-lb N rate."*

Table 2 of that same document concludes that the recommended spring application of nitrogen fertilizer at a 120lbs/acre would yield **nitrate loss to drain tile systems at 13.7 mg/l** – well above the state's Health Risk Limit for nitrate.

As this example suggests, the fertilizer application rates recommended by the UofM Extension are **designed to provide the rate that ensures maximum producer profitability.**

The clearly defined goal of the Groundwater Protection Act is to prevent degradation by altering groundwater from its natural condition by human activities. The MDA has not provided any reasonable explanation as to how nitrogen fertilization rates that yield pollution concentrations in excess of the HRL can possibly comply with the goals of the Groundwater Protection Act.

Figure 13 (*inset, right*) from the NFMP indicates the optimum fertilizer application rate as derived by the UofM Extension BMP approach.



FMR notes that the green "Nitrogen Loss" curve in Figure 13 represents total nitrogen loss at the defined optimal application rate. This loss represents a clear economic externality that is not accounted for in the economic optimization model.

The NFMP itself acknowledges this on page 41, stating *"The UofM BMP recommendations focus on managing the agronomic risk."* Agronomic risk factors are managed to ensure maximum agricultural profitability, not to minimize total nitrogen loss to Minnesota's surface waters and groundwater.

It is clear that MRTN is not the rate that minimizes pollution, but rather **the rate that maximizes producer profit**. This approach is unacceptable to Minnesotans who bear the significant financial and public health burdens of contaminated drinking water.

> Comment: The UofM BMP recommendations used in the NFMP are designed to promote maximum producer profitability. These BMPs are not tailored to achieve environmental outcomes, and may result in significant impacts to Minnesota's surface water and groundwater resources.
>
> Recommendation: The MDA should partner with the UofM and local stakeholders, including public and private well owners, to establish water quality based **Maximum Nitrogen Loss Levels** (MNLLs) in prioritized communities. MNLLs would be tailored to the needs of local groundwater resources, and would be derived from existing University of Minnesota Extension data.
>
> MNLLs would define the maximum allowable level of nitrate export under local conditions. The NFMP should then assign BMP fertilization application rates that result in nitrogen losses that do not exceed the MNLL.

In this way, BMP fertilizer application rates are localized to meet water resource goals, resulting in fair and efficient achievement of protection and restoration outcomes. In addition, because these MNLL rates are based on water quality needs, the NFMP will be insulated from changes in the MRTN recommendation approach resulting from unexpected swings in commodity and fertilizer prices.

2. Phase Determination Criteria

The draft NFMP utilizes a phased approach to determine the appropriate BMP adoption criteria and mitigation strategy, based on a variety factors included BMP adoption rate, groundwater nitrate concentrations, and other local factors. The NFMP includes the following table (*Table 9, below*) that summarizes the NFMP mitigation phase criteria.

Table 9. Mitigation Phases and Criteria

Groundwater Nitrate Concentration Criteria	5% wells >HRL OR 10% wells >7mg/L	10% wells > HRL	10% wells > HRL	15% wells > HRL
BMP Adoption Criteria	None	BMPs Adopted	BMPs not Adopted	
Mitigation Type	Voluntary		Regulatory	
Phase	1	2	3	4

NOTE: The Health Risk Limit for nitrate-nitrogen in Minnesota currently is 10 mg/L.

2a1: Phase 1 & 2:

Phase 1 is considered when 5% of the wells have nitrate levels greater than the HRL *or* 10% or more of the wells have groundwater concentrations greater than 7 mg/L. Phase 2 is considered when 10% of the wells have nitrate levels greater than the HRL *and* BMPs are being adopted *or* the response effort is initially promoting BMP adoption.

Comment: The threshold for Phase 1 is far too high. Postponing action until 1 in 20 local groundwater wells exceeds the HRL imposes a significant cost on local residents and businesses. These costs are excessive and should not be born by local residents absent some meaningful efforts to establish BMPs by agricultural operations.

Recommendation: Phase 1 should begin when 5% of wells exceed 7ppm. This level allows communities to engage in mitigation efforts before HRLs are exceeded, and before local residents are forced to invest in bottled water, expensive new wells, or residential de-nitrification systems.

Comment: The threshold for Phase 2 is far too high. Postponing regulatory action until more than 1 in 10 local groundwater wells exceed the HRL imposes significant costs on local residents. Asking 1 in 10 local families to make substantial investments in bottled water, de-nitrification systems, or new drinking water wells absent any accountability for the agricultural businesses responsible for that contamination is profoundly unfair.

Recommendation: Phase 2 should begin when 5% or more of local well exceed the HRL, or when 10% exceed 7ppm. This allows communities to establish clear nitrogen reduction strategies **before drinking water resources are contaminated**.

Given that the NFMP has been in place for more than 2 decades and nitrogen contamination is *increasing* in wells in 6 of 7 regions of the state, it should by now be abundantly clear to the MDA that an approach that relies strictly on voluntary BMP adoption to prevent groundwater degradation is insufficient.

Parents and families should not suffer the excessive costs and risks of contaminated drinking water for years to come while the MDA refuses to take meaningful regulatory action to protect the health and well being of our communities.

2a2: Page 81 of the NFMP states that *"…nitrogen fertilizer BMPs would need to be implemented on approximately 80% of available row crop land in order for the mitigation phase to meet adoption criteria."*

> Comment: This adoption rate goal is far too low, and is highly unlikely to result in meaningful nitrogen pollution reductions.
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> Recommendation: Include in table 9 the specific BMP adoption rate adherence thresholds that must be achieved in Phase 1 & Phase 2. FMR recommends that an 80% adoption level be set at the Phase I threshold, and a 95% adoption level be set as the Phase 2 threshold.
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> Recommendation: Modify the NFMP to include the provision that if Phase 1 & Phase 2 BMP adoption rates are not met, *or* if they are met but excessive nitrate levels persist, the NFMP should move to Phase 3 & 4 regulatory mitigation regardless of BMP adoption rates – since BMP adoption in that case will have been proven ineffective.

2b: Phase 3 & 4:
According the draft NFMP, Phase 3 is considered when 10% of the wells have nitrate levels greater than the HRL *and* BMPs are not being adopted. Phase 4 is considered when 15% or more of the wells have nitrate levels greater than the HRL *and* BMPs are not being adopted.

In the text above, as well as in Table 9 above, the phase criteria stipulates that Phase 3 and Phase 4 are not utilized if BMPs are being adopted.

This corresponds to the MDA's October 16th, 2013 presentation on the NFMP at the Minnesota Water Resources Conference, during which staff stated: "*If growers adopt best management practices, its very unlikely that regulation will be adopted."*

2b1: In the draft NFMP as written, the modest local adoption of inherently sub-optimal BMPs deprives the entire community of the Phase 3 and Phase 4 regulatory protections altogether, regardless of water quality conditions. This is profoundly unfair to local residents and is a serious flaw in the draft 2013 NFMP.

The serious health risk associated with elevated nitrate contamination in community and private drinking water supplies demands immediate intervention. The MDA is unwise to disregard this risk in an apparently interminable cycle of BMP promotion. A community with 10+% or 15+% of drinking water wells above the HRL should not have to wait for agricultural producers to install BMPs over the course of a multi-year crop rotation, only to see those same BMPs promoted all over again for another crop rotation, and another, and another…ad infinitum.

- The very UofM Extension BMPs promoted by the MDA are not determined by the Maximum Nitrogen Loss Level (MNLL) in a Phase 3 or Phase 4 scenario, as they should be. Instead, the **MDA assumes that a rate that ensures maximum producer profitability will be sufficient.** Adoption of BMPs at the economically optimal level may be insufficient to prevent 10% or 15%+ of wells from exceeding the HRL for nitrate in drinking water.

- Increased adoption of voluntary BMPs may depend on the availability of taxpayer funding. **Communities should not be excluded from the assistance that regulatory mitigation can provide because additional taxpayer dollars are not available to pay polluters to stop polluting.**

- Page 80 of the NFMP itself concludes that: "…at some locations the **widespread adoption of BMPs has not provided sufficient environmental benefits** to prevent exceeding the nitrate standard in drinking water".

If the MDA is truly confident that the promotion and adoption of current BMPs is sufficient to secure meaningful protections for groundwater resources in Minnesota, the agency need not fear unpopular Phase 3 & 4 regulatory intervention in the agricultural sector.

However, if those same BMPs prove insufficient to meet HRLs (as is clearly already the case in some parts of the state), it is unfair and unwise to deprive Minnesotans of the regulatory protections they deserve at the expense of public health.

> Comment: Phase 3 mitigation should be automatically triggered at the 10% threshold following the first crop rotation period of three years, regardless of whether or not any particular BMP adoption rate is achieved in Phase 1 or Phase 2.
>
> Phase 4 mitigation should be automatically triggered at the 15% threshold following the first crop rotation period of three years, OR if 10% wells exceed the HRL after the second crop rotation of 3 years. This should occur regardless of whether or not the 80% or 95% BMP adoption rates are achieved.
>
> Recommendation: Remove the BMP adoption criteria from Phase 3. If 10% of wells exceed the HRL after the first crop rotation of 3 years, the NFMP should move to Phase 3 regulatory mitigation without exception, regardless of whether or not the 80% or 95% BMP adoption rates are achieved.
>
> Recommendation: Remove the BMP adoption criteria from Phase 4. Phase 4 mitigation should be implemented if 15% of wells exceed the HRL after the first crop rotation of 3 years, *OR* if 10% of wells continue to exceed the HRL after the second crop rotation of 3 years. Phase 4 regulatory mitigation activities should proceed under these conditions regardless of whether or not the 80% or 95% BMP adoption rates are achieved.

3. Proposed mitigation activities

Despite decades of BMP promotion in Minnesota, the NFMP itself acknowledges on page 21 that "…the odds of elevated Nitrate concentrations [are] significantly higher in wells where the principal land use within one-quarter mile was agricultural."

3a: The NFMP lays out a 16-step process for addressing groundwater contamination through the multi-

phase mitigation process. FMR has many concerns about certain aspects of that process, independent of the phase determination concerns listed above. A sampling of these concerns are listed below.

Mitigation step #5: indicates that the local advisory team host a public information session for farmers. This meeting can and should include all parities involved, including those who are experiencing high levels of contamination in drinking water wells.

Mitigation steps #7, #10, #13: indicate that the advisory team activities should include efforts to identify and promote regionally specific BMPs. FMR understands that this activity has been occurring for at least 23 years, as that is the life span of the current NFMP, and is unsure as to how continued promotion and adoption of BMPs will yield a different result.

Mitigation step #8: We applaud the MDA for acknowledging here that *"at some locations the widespread adoption of BMPs has not provided sufficient environmental benefits to prevent exceeding the nitrate standard in drinking water."*

However, this step indicates that under this condition, the MDA will "*encourage*" the local advisory committee to move past BMPs to AMTs. If BMPs are adopted and HRLS remain exceeded, the MDA should require that AMTs are adopted, not merely encourage it.

Mitigation Step #16: Indicates that phase determination should:
|"Consider the following actions:
a. If the recommended BMPs are being adopted but are not effective in reducing nitrate contamination, promote additional management tools (e.g. AMTs) and/or consider revising the BMPs to address local conditions.
b. If the recommended BMPs are not being adopted, consider developing Water Resource Protection Requirements (rules)."

An arbitrarily assigned adoption rate of BMPs should not bar communities from pursuing WRPR adoption to protect their own drinking water resources. Phase determination is not the sole province of the MDA, and local communities must have the clearly established authority to develop WRPRs based on their sound judgment, independent of local BMP adoption rates.

3b: Additional mitigation activities to consider:
In general, additional mitigation activities are available to communities that exceed the items included on the list beginning on Page 84 of the NFMP. However, FMR recommends that the NFMP be amended to include the following:

Activities to consider for Phase 2

1. Sampling efforts and to provide information on nitrogen crediting for determining proper nitrogen fertilizer application rates.
2. Recommend and support developing irrigation, water management or nutrient management plans.
3. All farmers allow access to collect irrigation well water samples.
4. Farmers must report on their management practices, including nitrogen fertilizer and/or manure application rates, timing, sources and placement.

All of the above activities are common in agricultural landscapes and do not require farmers to take specific mitigation actions. By requiring meaningful planning and reporting activities (as distinct

from regulatory BMP adoption) advisory committee members can better assess practices and target additional effort.

Activities to consider for Phase 3:

1. Restrict practices to those that are considered "recommended" by regional University of Minnesota Extension Best Management Practices for Nitrogen, and exclude any and all practices labels "acceptable with risk".
2. Mandatory self-reporting on multiple aspects of nitrogen fertilizer use and environmental impacts including but not limited to expected and actual yields; water and soil tests; credits for past legume crop and manure or sludge; and laboratory testing and reports for soil and water analysis.
3. Require irrigation, water management and nutrient management plans.
4. Advisory groups identify locally appropriate Maximum Nitrate Loss Levels (MNLLs).

Activities to consider for Phase 4:

5. MNLLs are enforced on all farm operations.

3c: Evaluating Phase Implementation

On page 85, the NFMP states that that: *"A site may be downgraded if water quality monitoring results support that water quality has continuously improved to below the water quality guidelines, or the rate of BMP adoption has improved."*

Comment: FMR wishes to remind MDA staff that the 2013 Draft NFMP states the following: *"at some locations the widespread adoption of BMPs has not provided sufficient environmental benefits to prevent exceeding the nitrate standard in drinking water."*

The MDA cannot seriously propose that a phase downgrade can or should be the result of BMP adoption alone. Downgrading a mitigation phase if BMP adoption rates improve but water quality results do not is absurd. **Only water quality results should determine that a mitigation phase downgrade is appropriate.**

Recommendation: Revise to read as follows: *"A site may be downgraded to a lower phase if water quality monitoring results support that water quality has continuously improved to meet the water quality guidelines appropriate to that phase."*

The following paragraph assigns a "margin of assurance" of 10% below the HRL to suspend Phase 3 & Phase 4 rules, and reads as follows: "*A target of sustained monitoring results at least 10% below the water quality guideline may be appropriate to ensure the reduction is permanent."*

Comment: FMR wishes to remind the MDA that the goal of the Comprehensive Groundwater Protection Act is not simply achieving waters that are only 90% of the HRL.

Recommendation: Contamination levels can and should fall at least below the recommended Phase 2 threshold (Comment 2a1 above) before Phase 3 & 4 mitigation activities are suspended.

4. The Nitrogen Fertilizer Education and Promotion Team (NFEPT)

FMR notes that page 72 of the NFMP details the establishment of a new entity: the Nitrogen Fertilizer Education and Promotion Team (NEFPT). We are concerned about the role, makeup, and potential

conflicts of interest among the Nitrogen Fertilizer Education and Promotion Team (NEFPT) membership.

Comment: FMR notes that the NFEPT is open to fertilizer retailers. Fertilizer retailers have an explicit economic incentive to maximize the sale and distribution of nitrogen fertilizers in Minnesota. This is a clear conflict of interest. We are concerned that the presence and role of fertilizer retailers on the NFEPT may discourage the NFEPT from recommending strategies that do not align with the economic interests of the fertilizer industry.

Recommendation: Adopt strong conflict of interest rules for participation on the NFEPT. These rules must require the disclosure of any potential conflicts of interest among membership, and must exclude members that stand to profit directly from the sale and distribution of nitrogen fertilizers in Minnesota.

Comment: The NFMP is vague about the representation and responsibilities of the NFEPT.

Recommendation: the NFMP should be revised to include specific information on the intended makeup and role of the NFEPT. This should include the following:

- Intended and/or invited stakeholder representation, including environmental NGOs, public drinking water supply managers, and private well associations.
- A commitment that the NFEPT provide an annual report on its activities to the public.

5. Coordination & Prevention Efforts

FMR applauds the MDA for committing to coordinate with state and local governments and initiatives in order to efficiently achieve nitrogen pollution reductions. However, we are concerned about the language on page 74, paragraph 2, which states that:

"... However with the endorsement of the MPCA within the impaired waters process, it may be determined that the impacts of nitrogen fertilizer use on water resources may not be the highest priority concern and that the potential for increased nitrate concentrations in groundwater are an approved and acceptable tradeoff in order to promote specific BMPs that will be protective for other impairments."

Comment: FMR requests clarification as to what circumstances would result is this determination. Under what conditions would the adoption of nitrogen control BMPs on agricultural landscapes be incompatible with the adoption of additional BMPs that might address other surface water impairments? We are not clear as to how such practices would be deemed mutually exclusive, or how the MDA and MPCA would arrive at such a conclusion.

Recommendation: Provide an example in which the MPCA and MDA would arrive at such a determination, and provide scientific research as to how the adoption of BMPs that address surface water impairments would exclude additional or co-located BMPs that might address nitrogen pollution to groundwater in an agricultural landscape in that scenario.

Recommendation: Clarify what public entity would be charged with making such a final determination, and provide language stipulating that such a determination must accompanied by a public hearing and a public comment period of no less than 30 days.

On behalf of the board, staff, volunteers and members of Friends of the Mississippi River, I thank you for the opportunity to provide comments on the MDA's draft 2013 NFMP.

We appreciate the considerable efforts of MDA to develop this first draft of the 2013 NFMP, and appreciate the MDA's willingness to accept public comments on the draft.

FMR respectfully requests a written response to the comments included here, and looks forward to working with the MDA and all water quality stakeholders to revise the current draft to better protect groundwater resources for all Minnesotans.

Sincerely,

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