By Electronic Submittal and U.S. Mail

August 25, 2017

Dear Sir:

The Minnesota Natural Resource Coalition wishes to provide comment on the Minnesota Department of Agriculture’s draft Nitrogen Fertilizer Rule. Our comments and recommendations are attached to this letter.

We find that, under the mandates of Minnesota Statute 14.125, that the Department of Agriculture lacks the authority for rulemaking, more than eighteen months having lapsed since the enactment of the enabling Minnesota Statute 103H.275, unless and until the department seeks, and obtains additional authorization from the Minnesota Legislature.

We further find that the department has failed to quantify and take into account the many other natural and human-related sources of nitrate nitrogen contamination of affected groundwater in its proposal.

We further find that the Minnesota Environmental Quality Board has failed to ensure the creation of the single comprehensive statewide nitrate database that was mandated to be housed at and maintained by the Minnesota Geospatial Information Office as required by Minnesota Statute 103A.403.

We further find that the most effective programmatic approach to nitrate nitrogen management would be a single unified comprehensive program coordinated by the Environmental Quality Board and that such a program does not exist.

We therefore strongly recommend that the Minnesota Department of Agriculture withdraw consideration of its rulemaking proposal and concentrate on increased attention to identifying and implementing best management practices and alternatives for reducing nitrate nitrogen levels in groundwater for all sources. Further consideration for rulemaking should not take place unless and until the above programmatic deficiencies are resolved.

Chad Lange
President
Minnesota Natural Resource Coalition

J.R. Carlson
Acting Executive Director
Minnesota Natural Resource Coalition
Executive Summary

The Minnesota Department of Agriculture proposes rulemaking intended to protect groundwater from nitrate nitrogen contamination the agency attributes to the use of commercial nitrogen fertilizers. The agency’s current approach toward managing nitrate nitrogen levels in groundwater is the employment of agricultural best management practices and alternatives for the timing and application rates of commercial nitrogen fertilizers. Because some nitrogen-nitrate samples are testing above action levels, the agency believes it necessary to promulgate a regulatory approach to nitrate nitrogen management.

Minnesota’s policy for groundwater protection is vested in a multi-agency approach coordinated by the Minnesota Environmental Quality Board. In 1992 the Minnesota Legislature directed the Board to ensure that all data regarding the presence of nitrates in groundwater be integrated into a single statewide nitrate database that is currently mandated to be maintained by the Minnesota Geospatial Information Office. Although some agencies tasked with nitrate nitrogen share resources and databases, the single comprehensive database mandated by the legislature does not appear to exist.

An effective response to the presence of actionable levels of nitrate nitrogen in groundwater requires a single unified nitrate nitrogen management program with specific responsibilities for the agencies involved with Minnesota’s groundwater policy. The program, if it existed, would be coordinated among the agencies by the Environmental Quality Board.

The Department of Agriculture focuses on commercial nitrogen fertilizer as the source of groundwater nitrate nitrogen contamination, despite there being a number of other significant nitrate nitrogen contributors related both to natural sources and those related to human presence and activities. The proposal fails to describe, quantify, or account for any of these other sources. Lacking this information, the agency fails to adequately demonstrate a scientific justification for regulating the agricultural community’s use of commercial nitrogen fertilizer.

Minnesota Statute 14.125 mandates that a notice of intent to regulate by published within eighteen months of the date an enabling statute comes into effect. Because the enabling statute (Minnesota Statute 103H.275) for this proposed action came into effect several years ago, the authority for rulemaking under its provisions has expired. The department would have to request additional legislative authorization prior to initiating rulemaking responsive to the enabling statute.

The Minnesota Natural Resource Coalition strongly recommends that the Department of Agriculture withdraw consideration of the proposed rulemaking process.
Introduction

The Minnesota Natural Resource Coalition (MnNRC) is submitting these comments in response to the Minnesota Department of Agriculture's (MDA) Draft Nitrogen Fertilizer Rule\(^1\) (NFR) request for comment dated June 7, 2017.

The NFR is an administrative action intended to reduce potential sources of nitrate pollution to the state’s surface and groundwater, and the regulatory program is particularly aimed at drinking water.

From a technical perspective, the NFR is based upon the *Minnesota Nitrogen Fertilizer Management Plan*,\(^2\) having a regulatory foundation in Minnesota Statute 103H.275\(^3\). MDA intends the NFR to have the full force and effect of law, and not merely be an interpretation of provisions within Minnesota Statute 103H.275. The NFR would require agricultural operations to employ University of Minnesota prescribed best management practices (BMPs) and timeframes during application nitrogen-based fertilizers, transitioning a once-voluntary, academically-promoted BMPs\(^4\) to having regulatory and punitive status.

The NFR proposes a four-tiered mitigation program tied to geographical water maps derived from fragmented, scope-limited, and protocol-questionable water quality data. Those areas containing higher nitrogen concentrations carry increasing mitigative restrictions and penalties than areas associated with lower water quality resource protection requirements. The public record is silent as to what methodology was employed to determine, demarcate and verify the map boundaries, or if they were field surveyed for accuracy and regulatory compliance purposes.

Minnesota’s groundwater policy, codified at 103A.204\(^5\), mandates protection of groundwater is to take place using a multi-agency approach, with various agencies having specific, programmatic responsibilities. Statewide coordination of water quality programs is the responsibility of the Environmental Quality Board (EQB). The Minnesota legislature intends EQB to be at the center of a statewide, multi-agency approach to nitrate-nitrogen (nitrate-N) assessment, monitoring and source determination, and for there is to be one centralized data base for compliance and regulatory purposes\(^6\).

The NFR determines nitrogen to be an agricultural chemical\(^7\) pollutant for the purposes of the rule, and then purports to improve ground water quality by regulating discreet inputs to surface water from a small-source contributor — the agricultural sector. The NFR ignores fundamental, technical and scientific aspects of surface and groundwater intermixing, does not account contributions from primary, indigenous or manmade nitrate-N sources, and disregards data from state and federal TMDL programs. The NFR proposes to regulate sector-specific surface inputs without a rudimentary understanding of the regional mass contributions of nitrogen from publicly owned wastewater treatment plants, septic systems and contributions from wildlife, avian and invasive fish sources.

Minnesota farmers already apply lower amounts of nitrogen fertilizer to crop land than farmers in surrounding states, and they employ best management practices (BMPs) supported by current advanced

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\(^1\) [Draft Nitrogen Fertilizer Rule](#)
\(^2\) [Minnesota Nitrogen Fertilizer Management Plan, March 2015, Minnesota Department of Agriculture](#)
\(^3\) [Minnesota Statute 103H.275 (Minnesota Statutes, 2016 Edition)](#)
\(^4\) [Documents incorporated by reference](#)
\(^5\) [Minnesota Statute 103A.204 (Minnesota Statutes, 2016 Edition)](#)
\(^6\) [Minnesota Statute 103A.403 (Minnesota Statutes, 2016 Edition)](#)
\(^7\) [Minnesota Statute 18E.02 (Minnesota Statutes, 2016 Edition)](#)
and emerging technologies\textsuperscript{8}. The agricultural sector is economically motivated to continually improve their practices, and they much prefer to work through voluntary participation rather than to respond to regulatory frameworks imposed by academia and executive-branch agencies.

**Issues**

Access to high-quality, peer-reviewed, scientific data forms the basis of good public policy. To that end, in 1992 the Minnesota legislature enacted 1992 c 544 s 4, codified in statute as 103A.403\textsuperscript{9}. This law mandates that the Environmental Quality Board establish a database that incorporates \textit{all} available nitrate groundwater data into the \textit{Minnesota Land Management Center’s Statewide Nitrate Database}. In 2009, the legislature amended the law with 2009 c 101 art 2 s 107, and changed the term \textit{“Land Management Center”} with the term \textit{“Minnesota Geospatial Information Office.”}

There currently is no database of the mandated name maintained by the Minnesota Geospatial Information Office\textsuperscript{10}. There is, however, an integrated shared database that is contributed to by MDA and the Minnesota Pollution Control Agency (MPCA) managed between those two agencies.

The failure of full compliance with Minnesota Statute 103A.403 throughout the 25-year period means data are not accessible in their statutorily mandated location for use by multiple executive branch agencies.

The mandate for a comprehensive database indicates that the state legislature intends that a unified, multi-agency, coordinated nitrate-N management program be put in place, coordinated by EQB. Although groundwater monitoring and assessment is taking place responsive to Minnesota Statute 103H.175\textsuperscript{11}, it is not solely dedicated to Nitrate-N monitoring as mandated by 103A.403. Such a dedicated Nitrate-N program does not appear exist, decades after the legislature promulgated its intent. MDA proposes to issue a rule that would affect a single business sector — and this without adequate data (including non-agricultural nitrate-N sources) necessary to demonstrate a valid, verifiable, scientific or administrative basis for regulating that sector in isolation.

Minnesota lacks a robust network of dedicated, groundwater quality testing wells, and in the alternative MDA is relying on nitrate-N screening samples obtained from private and public well systems. MDA expects the program to be complete in 2019, which means the NFR is being promulgated from an incomplete data set. This approach raises a host of data-integrity, consistency, timing, sample collection, well construction, and other methodological questions that normally would be considered fundamental to rulemaking processes.

While public water sources, including wells, are generally protected from nitrate-N contamination, the same is not necessarily true for private wells. Public wells are typically better maintained than private well systems, affording fewer opportunities for sample problems originating from casing damage, lack of grout seals, screen problems or cross-contamination.

Private wells are often drilled in closer proximity to on-site wastewater treatment systems (OSS) than any public wells, and because there are no denitrification requirements for those systems, there remains opportunities that nitrate-N from a private well could be sourced to a nearby OSS, as opposed to nitrogen

\textsuperscript{8} \url{https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Chemical_Use/index.php}  
\textsuperscript{9} \url{Minnesota Statute 103A.403 (Minnesota Statutes, 2016 Edition)}  
\textsuperscript{10} \url{http://www.mngeo.state.mn.us/}; Conversation with Mike Dolbow, GIS Supervisor, August 21, 2017  
\textsuperscript{11} \url{Minnesota Statute 103H.175 (Minnesota Statutes, 2016 Edition)}
fertilizer applications to nearby crop land. It is unlikely the incomplete MDA screening program adequately controls for these potential sample integrity issues.

The proposed rule focuses entirely on the nitrate-N associated with commercial nitrogen fertilizers, despite regional, unquantified nitrate-N contributions from indigenous, avian, and aquatic sources to surface and groundwater systems. Examples include:

- Because surface water intermixes with groundwater, nitrate-N data from surface waters, rivers, streams, lakes, ponds and reservoirs is necessary to ascertain nitrogen loading to groundwater systems. As of July 25, 2013, U.S. Environmental Protection Agency (EPA) data note that Minnesota had no numeric criteria for nitrogen in surface waters, nor does it intend to develop such criteria\(^\text{12}\).

- Minnesota has 362 municipal sewage treatment facilities, also known as publicly-owned treatment works (POTW). None of these sources that discharge to state waterways have established, numeric effluent limits for nitrogen. Indeed, only 15 of the largest Minnesota POTWs even monitor their effluent for nitrogen whatsoever\(^\text{13}\).

- On-site treatment systems (septic systems) represent another unquantified nitrogen source. These systems occur throughout Minnesota, including agrarian areas. (Approximately 30% of Minnesotans use on-site systems to treat wastewater.\(^\text{14}\)) Septic systems contribute nitrogen to the groundwater systems through their leachfields. Although treatment technologies exist for septic wastewater,\(^\text{15}\) effluent denitrification is expensive and must be assessed as part of a comprehensive approach to reducing the presence of nitrate-N in groundwater.

- To our astonishment, MDA has not quantified the massive contribution of nitrogen by direct-deposition of feces into water bodies from avian and other wildlife. (The words “wildlife excretions” on page 110 of the Minnesota Nitrogen Fertilizer Management Plan are the sole reference in the plan.) In reality, waterfowl and other wildlife are significant contributors of nitrogen deposition throughout their life cycles\(^\text{16, 17, 18}\). Non-avian wildlife numbers remain relatively stable throughout the year, as to where contributions from avian species fluctuate with migratory seasons and pathways. Minnesota is located in the heart of the Mississippi Flyway, which features extraordinary volumes of avian populations coincident with the spring and fall agricultural fertilizer application. Because


\(^\text{13}\) [https://www.epa.gov/sites/production/files/2017-06/documents/potw_nutrient_lim_and_mon_as_of_2_5_2016_2.08.17.pdf](https://www.epa.gov/sites/production/files/2017-06/documents/potw_nutrient_lim_and_mon_as_of_2_5_2016_2.08.17.pdf)

\(^\text{14}\) OIbsite Treatment of Septic Tank Effluent in Minnesota using SSF Constructed Wetlands

\(^\text{15}\) Evaluation of a Recirculating Sand Filter Followed by a Subsurface-Flow Constructed Wetland to Achieve Denitrification Small Flows Quarterly, Fall 2003, Volume 4, Number 4

\(^\text{16}\) Estimating the contribution of nitrogen and phosphorus to waterbodies by colonial nesting birds

\(^\text{17}\) The Effect of Aquatic Birds on the Nutrient Load and Water Quality of Soda Pans in Hungary

\(^\text{18}\) Impact of Geese on the Limnology of Lakes and Ponds from Bylot Island (Nunavut, Canada)
everyone involved in the development of nitrogen BMPs is closely focused on the agricultural contributions of nitrogen, wildlife and avian applications to the lands and water bodies have been both overlooked and unquantified. This unquantified system input is being aggravated by the riparian buffer system mandated in Minnesota Statute 103F.48\textsuperscript{19}, because buffers serve as to invite larger numbers of birds and other wildlife to areas immediately adjacent to water bodies.

- The common carp (\textit{Cyprinus carpio}) was introduced into North America in the late 1800s. This invasive species raises water turbidity and uproots aquatic plants in search for food in sediments, a condition which often results in \textit{elimination} of immersed plants in waterbodies. Carp abundance tends to be highest in hypereutrophic ponds and lakes in agricultural and urban areas, such as around the Twin Cities. Carp-induced declines in plant diversity and alterations in fundamental ecosystem functions affect nutrient sequestration and transportation, which result in system imbalances. This represents a significant interruption to the functioning of the nitrogen cycle found in water bodies that have not been invaded by carp and which retain a normal level of aquatic plant diversity. Recent research demonstrates that invasive common carp are more damaging to biodiversity than even human development\textsuperscript{20}. Many of the waterbodies impacted by carp infestations in Minnesota are found in the agricultural areas that are the focus of the MDA’s draft rule. The level of additional nitrate-N in the impacted region attributable to carp-damaged aquatic ecosystems has not been quantified.

Several of the nitrate-N sources in groundwater are not associated with crop production, and have not been quantified in a process designed to the actual portion of nitrate-N attributable to the use of industrial fertilizer. Lacking information that would be available from the nitrate database mandated in Minnesota Statute 103A.403, we present EPA data from Minnesota’s TMDL program to illustrate the relative contributions to the state’s impaired waters from six sources that deliver nitrogen to flowing and static waters. All of these sources contribute to the total nitrogen load in surface waters that lose to hydraulically connected groundwater, adding to nitrate-N levels in groundwater.

### Site-Specific Targeted Monitoring Results, Minnesota Impaired Waters (2012)\textsuperscript{21}

<table>
<thead>
<tr>
<th>Probable Source</th>
<th>Rivers and Streams</th>
<th>Lakes, Reservoirs, Ponds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Miles Impaired</td>
<td>Acres Impaired</td>
</tr>
<tr>
<td>Internal Nutrient Recycling</td>
<td></td>
<td>11,958.0</td>
</tr>
<tr>
<td>On-Site Treatment Systems</td>
<td>1,579.8</td>
<td>9,767.0</td>
</tr>
<tr>
<td>Municipal Point Source (POTW)</td>
<td>1,485.0</td>
<td>6,519.0</td>
</tr>
<tr>
<td>Wildlife Other Than Waterfowl</td>
<td>1,435.7</td>
<td>813.0</td>
</tr>
<tr>
<td>Waterfowl</td>
<td>836.7</td>
<td>813.0</td>
</tr>
<tr>
<td>Crop Production</td>
<td>405.7</td>
<td>5,972.0</td>
</tr>
</tbody>
</table>

The selected sources share the characteristic of including significant levels of nitrogen. Three sources are connected with human presence and activity. Three sources are natural sources that are present in the monitored ecosystems regardless of human presence. Wildlife/Waterfowl bodily waste in lakes, reservoirs, and ponds, when decomposing, is presumed to become part of the internal nutrient recycling source.

\textsuperscript{19} Minnesota Statute 103F.48 (Minnesota Statutes, 2016 Edition, annotated with uncodified 2017 amending language)

\textsuperscript{20} Biological invasion by a benthivorous fish reduced the cover and species richness of aquatic plants in most lakes of a large North American ecoregion, Bajer et. al., Global Change Biology (2016), doi: / gcb.13377

\textsuperscript{21} U.S. EPA Minnesota Water Quality Assessment Report (Source for table data)
Minnesota Statute 14.125 mandates that an agency shall publish a notice of intent to adopt rules within 18 months of the effective date of the law authorizing the adoption of rules. If the notice is not published within the time limit, rulemaking authority under that law expires. MDA is well outside that window in respect to Minnesota Statute 103H.275. Unless MDA seeks and obtains additional legislative authorization, the proposed rulemaking cannot proceed.

Conclusions and Recommendations

Conclusions

- Nitrate-N in groundwater has been demonstrated to be at or above action levels in some locations in Minnesota.

- Minnesota’s groundwater policy is vested in a multi-agency approach that is statutorily mandated (Minnesota Statute 130A.204) to be coordinated by the Minnesota Environmental Quality Board (EQB). There is a wholesale administrative breakdown in regard to nitrate-N groundwater contamination evidenced by a failure of the EQB to coordinate the development of a unified statewide Nitrate-N program with well-defined roles and actions for each of the agencies the legislature assigned groundwater responsibilities to.

- In 1992 the legislature mandated that the EQB ensure that all available data regarding the presence of nitrate-N in groundwater be integrated into a statewide nitrate database. In 2009 the statute was amended to require that the database be managed by the Minnesota Geospatial Information Office (MGIO). We confirmed with the MGIO that the mandated database does not exist at their location. This failure to comply with the plain language of the statute has resulted in nitrate data being fragmented among executive agencies making development of a unified, statewide nitrate-N program far more challenging than was originally contemplated.

- MDA’s proposal to issue the NFR and assertion to control nitrate-N impacts to groundwater without a completed dataset demonstrates failure of the EQB and raises fundamental questions about a complete or adequate data set. This is in no small part due to failures to adequately quantify nitrogen inputs from the multiple sources, several of which are present in the same areas at the same time crop land is receiving nitrogen fertilizer applications.

- Because Minnesota Statute 103A.204 was enacted in 1994 and amended in 2008, and because MDA did not publish a notice of intent to regulate within eighteen months of the statute’s enactment, MDA lacks the authority to engage in new rulemaking under the limitation established under Minnesota Statute 14.125.

Recommendations

- We recommend that MDA withdraw the nitrogen fertilizer rule from further consideration, and replace the rule with a renewed effort to provide advanced and adequate BMP support to the Minnesota’s agrarian sector. As stewards of the land, the farming community itself is in the best position to address nitrate-N issues on a site-specific basis. No regulatory rulemaking should be considered until a comprehensive, statewide program for nitrate-N monitoring, management, and

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mapping has scientifically and definitively concluded a voluntary BMP-driven system has failed, and that there is reasonable certainty that regulation will result in improved water quality.

- The Minnesota EQB needs to immediately come into compliance with Minnesota Statute 103A.403 by ensuring that all available data regarding the presence of nitrate-N in groundwater are incorporated into an integrated database accessible by all Minnesota agencies with responsibility for groundwater management and protection. The database must be housed and maintained by the Minnesota Geospatial Information Office as mandated by the statute.

- In order for Minnesota to have an effective response to nitrate-N contamination of groundwater, the EQB must coordinate the development of a single unified statewide comprehensive program for assessing nitrate-N sources to groundwater. Effective monitoring of all nitrogen inputs to surface water and groundwater must be monitored with validated numeric criteria for nitrate-N and total nitrogen established. All nitrogen sources with potential for contributing to nitrate-N presence in groundwater must be considered in the development and implementation of the program.

- To ensure adequate data quality for any rulemaking of nitrate-N impacts to groundwater, the State of Minnesota needs to install a dedicated network of test wells across the state. A rigorous set of protocols for collecting, transporting and analyzing of water samples, accompanied by strict chain-of-custody procedures, must be implemented to ensure data set integrity. Analysis of water quality samples for regulatory purposes must be performed in a certified laboratory with stringent QA/QC protocols.

- Because the enabling statutes for regulation of agricultural and other human activities were enacted more than eighteen months ago, any agency contemplating rulemaking in regard to those statutes must seek additional authorization from the legislature prior to engaging in rulemaking in regard to those statutes.

- A cost-benefit analysis of regulating the agrarian sector for nitrate-N must be conducted to establish impacts to human systems, cultures, customs and local Minnesota economies. If any federal funding has been accepted by MDA or agencies associated with the NFR, then federal law requires that an Environmental Impact Statement (EIS) be performed to assess the impacts to both the human and natural systems.