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Annie Felix-Gerth
Pesticide and Fertilizer Management Division
Minnesota Department of Agriculture
625 Robert Street North
St. Paul, MN 55155-2538

Dear Ms. Felix-Gerth:

The Minnesota Corn Growers Association (MCGA) appreciates this opportunity to comment on behalf of over 6,700 farmer members on the Draft Nitrogen Fertilizer Management Plan (NFMP). Many Minnesota farm families rely on groundwater as a source of drinking water and to support agricultural production activities. Consequently, MCGA places a high priority on protecting groundwater from human degradation based on a practicable framework. To that end we offer the following comments to be considered in the development of the final version of the NFMP and its subsequent implementation.

General Comments

- There may be value in following Chapter 3, 'Groundwater Contamination and Sensitive Areas,' with Chapter 6, 'Nitrate Conditions in Minnesota Groundwater.' Chapter 3 provides soil, geologic, and climatic context for the observed nitrate conditions presented in Chapter 6. It would be useful to more closely connect these two chapters and then follow them with the information on nitrogen sources and best management practices (BMPs) that is presented later in the NFMP.
- Information presented in Chapter 4, 'Nitrogen Cycle, Sources and Trends,' and Appendix C cites statewide sources of nitrogen inputs to Minnesota cropland. Figure 9 acknowledges that the relative percentages of these sources may not directly relate to amounts reaching groundwater. Though the statewide values provide some context for nitrogen sources, it is more relevant to understand the relative magnitude of these sources and their relationship to groundwater in the sensitive areas of the state that are well documented in the NFMP which may be significantly different from the statewide depiction of nitrogen sources to cropland. The information

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presented in Appendix D could be incorporated into this chapter as it highlights some of these regional differences related to sources of nitrogen in areas sensitive to groundwater contamination.

Comments on Specific Chapters

- Chpt. 1, P. 12: It is important to distinguish crop root zone water from groundwater in this section as there may be confusion as to whether the latter is inclusive of the former.
- Chpt. 1, P. 16: The statement regarding tile drainage not being a high priority for a localized response to groundwater contamination is an important one that needs to be highlighted as the NFMP is implemented.
- Chpt. 2, P. 18: Is the drinking water standard the primary metric used to determine groundwater degradation as it relates to nitrate-nitrogen? It might be useful to state that more directly in this section as it is also one of the fundamental criteria of the mitigation plan presented later in the NFMP.
- Chpt. 2, P. 19: If the drinking water standard is the primary basis of the mitigation plan criteria, it doesn't seem germane to present health effects that haven't been conclusively substantiated in the literature nor used to establish nitrate-nitrogen standards for groundwater quality.
- Chpt. 2, Pp. 19 – 21: *Economic Cost of Nitrate Contamination* – this section addresses mitigation strategies that can be used to address private and public well nitrate-nitrogen contamination. Is the purpose of this section to highlight examples of mitigation strategies or the cost of mitigation strategies? If it is the former, then should these practices be highlighted later in the document in the discussion of mitigation practices? If it is the latter, is it appropriate to also include the costs associated with other mitigation strategies that go beyond the Best Management Practices (BMPs) such as Alternative Management Tools (AMTs)? AMTs such as retiring land from production and installing easements also have financial costs associated with them. Are statewide data available indicating how many public and private wells have had to use the options outlined in this section in response to elevated nitrate-nitrogen concentrations?
- Chpt. 2, P. 22: The issues described under the 'Other Risks' section are very complex and primarily surface water related. A comprehensive explanation is needed to grasp these issues. The NFMP is focused on groundwater degradation so inclusion of these issues does not seem warranted.
- Chpt. 4, Pp. 34 – 35: It is important in Figure 9 to clarify that 'Cropland Soil Mineralization' is actually net mineralization which accounts for the inorganic nitrogen from cropland fertilizer and manure that is immobilized by micro-organisms and plants. This section should also highlight the information presented on page 107 related to the uncertainty of net mineralization estimates which are highly dependent on variations in soil moisture and temperature.
- Chpt. 4, P. Pp. 37 – 39: A form of Figure 13 is used in at least two University of Minnesota Extension publications (BU-07936 and 08560). It would be useful to cite the exact publications from which this is adapted. In each of the publications the graphic appears slightly different and has differences in the accompanying explanation. It would be useful to clarify that this is a

conceptual diagram that illustrates the impact nitrogen rate has on crop yield and its potential loss to groundwater at a field scale from a corn production system. It is also important to note that there are a number of environmental and management related factors that influence nitrate-nitrogen leaching as reflected in the BMP section presented in Chapter 5. Supplementing or replacing Figure 13 with a summary of data collected in Minnesota demonstrating the relationship of these factors to leaching losses of nitrate-nitrogen is recommended.

- Chpt. 5, P. 41: Not all components of the 4 R's have equal agronomic and environmental consequences. In certain situations, some factors are more important than others such as the effects of source versus rate.
- Chpt. 5, P. 43: It is important to note that the nitrogen guidelines for fertilizing corn in Minnesota (University of Minnesota Extension, FO-3790-C) also account for soil productivity and previous crop in addition to the price/value ratio. Some soils have a reduced yield potential attributed to erosion, reduced water holding capacity, sandy soil texture, and poor drainage. Yield goal has not been disregarded in this approach but rather accounted for in the context of soil productivity potential.
- Chpt. 7, P. 65: Is the goal of the monitoring and assessment to characterize the condition of the drinking water within a particular township or to assess the condition of the underlying aquifer(s)? The goal stated in the opening sentence is unclear whether it refers to the drinking water portion of groundwater as this is an important distinction. The 'Monitoring Strategy' section should reference the information presented in Chapter 6 and page 126 to clarify the use of private wells to assess ambient drinking water quality as opposed to monitoring wells which may not reflect drinking water conditions and in many cases have higher concentrations of nitrate-nitrogen.
- Chpt. 7, P. 66: Figure 19 and Appendix H indicate that wells would be screened for potential impacts from non-fertilizer sources. Appendix H indicates that wells that are hand-dug construction will not be included in the statistical data analysis. Page 29, 57, and 63 highlight the importance of well construction and groundwater quality. Given this documented relationship, will well construction characteristics also be considered in the screening process during the assessment period? It is important to separate site-specific drinking water issues such as well construction from regional drinking water issues such as potential impacts from nitrogen fertilizer before advancing in the phases of the mitigation framework.
- Chpt. 9, P. 76: What is the rationale for the criteria used to distinguish the four implementation phases of the mitigation framework? Are these criteria based on the Nebraska Central Platte Natural Resources District phased approach?
- Chpt. 9, Pp. 77 – 83: Are certain activities listed in mitigation process associated with specific implementation phases of the mitigation framework? Is it possible to identify which phases are associated with each of the activities listed?
- Chpt. 9, P. 78: What are the specific well construction criteria (other than hand dug wells) that will be used to confirm there is a problem related to nitrogen fertilizer rather than well construction?

- Chpt. 9, P. 78: Details regarding the formation and composition of the local advisory team need to be specified. How many representatives from each entity will be recruited and what criteria will be used to determine who is eligible to serve on the team need to be documented. Given the importance of this team in the mitigation framework, the formation of this team needs to be thoughtfully articulated considering the lessons learned that are presented in Appendix A.
- Chpt. 9, P. 86: The standard that the Minnesota Pollution Control Agency has currently promulgated for nitrate-nitrogen in surface waters is only applicable to those waters that have a drinking water beneficial use designation. A nitrate-nitrogen standard for aquatic life toxicity is being developed but it has not undergone the rulemaking process to date.
- Chpt. 9, P. 87: Will the practicable prevention goal of the Groundwater Protection Act be observed when a total maximum daily load (TMDL) nitrate-nitrogen goal for groundwater in a specific area has been identified? A future TMDL plan may identify a nitrate-nitrogen goal that is significantly lower than the drinking water standard making it necessary to consider the practicable prevention aspects of the Groundwater Protection Act.

Thank you for the opportunity to provide comments. Please feel free to contact Adam Birr (abirr@mncorn.org, 952-460-3606) for follow up discussion on specific comments.

Best Regards,

Ryan Buck, President
Minnesota Corn Growers Association