

**BEFORE THE
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

Petition for Emergency Action Pursuant to
the Safe Drinking Water Act, 42 U.S.C. § 300i,
to Protect the Citizens of the Karst Region of
Minnesota from Imminent and Substantial
Endangerment to Public Health Caused By
Nitrate Contamination of Underground
Sources of Drinking Water.

EPA Docket No. _____
April 24, 2023

**Submitted on Behalf of Petitioners
Minnesota Center for Environmental Advocacy,
Environmental Working Group,
Minnesota Well Owners Organization,
Center for Food Safety,
Clean Up the River Environment,
Food & Water Watch,
Friends of the Mississippi River,
Izaak Walton League Minnesota Division
Land Stewardship Project,
Minnesota Trout Unlimited,
and
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I. Introduction

Petitioners respectfully petition the U.S. Environmental Protection Agency (EPA) to exercise its emergency powers established in Section 1431 of the Safe Drinking Water Act (SDWA), 42 U.S.C. § 300i, to address groundwater contamination that presents an imminent and substantial endangerment to the health of residents in southeastern Minnesota. Like many other parts of the Nation plagued by pollution from industrial agriculture, the residents in southeastern Minnesota are suffering from drinking water contamination. As detailed in this Petition, this region has an extensive and well-documented history of nitrate contamination in its underground sources of drinking water, which continues to put the health of residents at risk. The EPA must act now to address this too-long ignored health crisis and ensure clean drinking water for Minnesotans.

Southeastern Minnesota is particularly vulnerable to groundwater pollution due to its karst geography. According to the Minnesota Pollution Control Agency (MPCA):

Southeastern Minnesota is characterized by an unusual type of geography called karst. It features rolling hills, hollows, caves, sinkholes, and dramatic bluffs and valleys. In karst landscapes, the distinction between groundwater and surface water is blurry. . . . [C]ontaminated surface water can easily become groundwater pollution, and pose a health risk to those using it for drinking.¹

The “karst region” of southeastern Minnesota is depicted in Figure 1 below.²

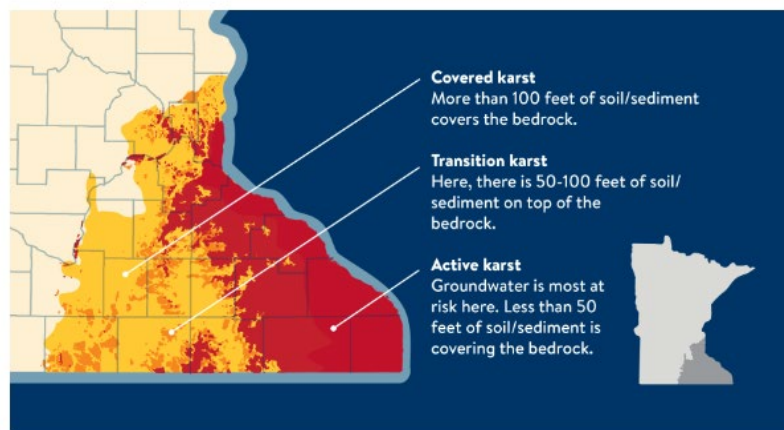


Figure 1: Minnesota’s Karst Region

Based on a map created by E. Calvin Alexander, Jr., Yongli Gao, and Jeff Green

¹ *Protecting water in karst regions*, MINN. POLLUTION CONTROL AGENCY, <https://www.pca.state.mn.us/air-water-land-climate/protecting-water-in-karst-regions> (last visited Apr. 13, 2023).

² *Id.*

The karst region³ is a predominantly rural area of the State where many people rely on private wells, rather than public water supplies, for their drinking water.⁴ All drinking water in this region—public and private—comes from groundwater aquifers. The population of the eight counties comprising this region is 380,513.⁵ About 300,000 people in this area rely on community water systems while the remaining 80,000 use wells.⁶ It is important to note that the populations more likely to be affected by nitrate contamination are people living in small towns, who are dependent on community water systems and private wells and who are also more likely to be of lower income.⁷ The karst region of Minnesota is a community overburdened by pollution. The Administrator has called on EPA to strengthen the enforcement of cornerstone environmental statutes in these communities.⁸

This Petition is based on data that have been compiled by the Minnesota Department of Agriculture (MDA), the Minnesota Department of Health (MDH), the Minnesota Pollution Control Agency (MPCA), the Minnesota Department of Natural Resources (MDNR), Petitioner Minnesota Well Owners Organization, and Petitioner Environmental Working Group. The data demonstrate that nitrate concentrations in

³ The karst region does not follow county lines, but for purposes of data analysis, this Petition uses the eight counties of Dodge, Fillmore, Goodhue, Houston, Mower, Olmsted, Wabasha, and Winona as a substitute. These counties are all fully within what is considered the karst region.

⁴ For information on community water systems in Minnesota that rely on groundwater see *Interactive Map: Community Water Systems*, MINN. DEP'T OF HEALTH, <https://mndata.maps.web.health.state.mn.us/interactive/cwss.html> (last visited Apr. 13, 2023). For further data on private wells in Minnesota, see *Minnesota Well Index*, MINN. DEP'T OF HEALTH, <https://mnwellindex.web.health.state.mn.us/#> (last visited Apr. 13, 2023).

⁵ See *Minnesota Demographics*, CUBIT PLANNING, https://www.minnesota-demographics.com/counties_by_population (last visited Apr. 13, 2023).

⁶ The population served by each community water system in the eight-county region system can be determined by clicking on MDH's water system map, see *Interactive Map: Community Water Systems*, MINN. DEP'T OF HEALTH, <https://mndata.maps.web.health.state.mn.us/interactive/cwss.html> (last visited Apr. 13, 2023).

⁷ *Tap Water for 500,000 Minnesotans Contaminated With Elevated Levels of Nitrate*, ENV'T WORKING GRP. (Jan. 14, 2020), https://www.ewg.org/interactive-maps/2020_nitrate_in_minnesota_drinking_water_from_groundwater_sources/ [hereinafter EWG Tap Water Report]; see also *Interactive Maps: Poverty in Minnesota counties*, MINN. DEP'T OF HEALTH, <https://mndata.maps.web.health.state.mn.us/interactive/poverty.html> (last visited Apr. 14, 2023).

⁸ Memorandum from Lawrence E. Starfield, Acting Assistant Adm'r of U.S. EPA, on Strengthening Enf't in Communities with Env't Just. Concerns to Office of Enf't and Compliance Assurance (Apr. 30, 2021), <https://www.epa.gov/sites/default/files/2021-04/documents/strengtheningenforcementincommunitieswiththejconcerns.pdf>.

public water systems and underground sources of drinking water routinely exceed federal and state drinking water standards, putting the health of area residents at serious risk.

As explained in this Petition, the well-documented nitrate contamination of drinking water in the karst region necessitates prompt and decisive EPA emergency action under the SDWA. Elevated levels of nitrate in drinking water are known to increase the risk of a wide range of very serious health problems, including birth defects, blue-baby syndrome, various cancers, thyroid disease, and other maladies. This contamination poses an imminent and substantial threat to human health, and the problem is not getting any better.

Despite Minnesota applying for and being granted “primacy” under the SDWA, state and local officials have failed to do what is needed to correct the pervasive threat to human health. The data confirm that past voluntary measures employed by the State have been unsuccessful at reducing nitrate concentrations in crucial drinking water sources to below federal and state standards. EPA is fully empowered under the SDWA to take emergency action to protect human health in the karst region of Minnesota given present circumstances.

Because of its landscape features, groundwater quality in the karst region is largely driven by land use practices, and land use in this region is dominated by industrial row crop agriculture and feedlots. Petitioners request that EPA act to protect human health and effectuate the goals of the SDWA in the karst region of Minnesota through an investigation focused on the agricultural land uses that are most likely driving the contamination of drinking water resources. Specifically, Petitioners request that EPA issue orders, as necessary, to protect the health of people who use the drinking water, including, at a minimum, orders that require responsible contaminators to provide a free and safe alternative source of drinking water for impacted communities; orders that prohibit concentrated animal feeding operations (CAFOs) from expanding or constructing new operations until nitrate concentrations fall below unsafe levels; public notice of potential contamination events, such as manure land applications; an investigation to determine the specific entities and land use practices causing the contamination; a survey to identify public water systems, private supply wells, or ground water monitoring wells near potentially contaminated areas; monitoring of contaminants; control of the source of contaminants; and cleanup of contaminated soils endangering underground sources of drinking water. Petitioners further request that EPA seek injunctions through civil actions, as needed, to return the area’s underground aquifers to a safe and drinkable condition.

II. Interests of Petitioners

Minnesota Center for Environmental Advocacy (MCEA) is a nonprofit environmental advocacy organization with offices in St. Paul and Duluth, Minnesota.

Since 1974, MCEA has defended Minnesota's natural resources, water, air and climate, and the health and welfare of Minnesotans. MCEA is driven by the principle that everyone has a right to a clean and healthy environment, and that decisions must be based on fact, science, and the law.

Environmental Working Group (EWG) is a nonprofit, nonpartisan organization that empowers people to live healthier lives in a healthier environment. For 30 years, EWG has harnessed its signature blend of research, advocacy, and unique educational tools to drive consumer choice and inspire civic action.

Minnesota Well Owners Organization (MNWOO) is a statewide nonprofit with a mission to help ensure safe drinking for Minnesota private well users who depend on groundwater for their private water systems and wells. MNWOO works with well users and partners with other non-governmental organizations, and local and state government units to build individual and community values for the protection, enhancement, and restoration of Minnesota groundwater through outreach, education, and advocacy. MNWOO's goal is to conduct free water quality screening clinics and provide professional help to connect and activate the community of well owners, land managers, water managers, and policy makers who steward Minnesota's groundwater. MNWOO seeks to remove the threats to safe drinking water on a foundation of accurate, up-to-date, and practical information that addresses the personal, community, economic, technical, legal, and policy barriers faced by private well owners seeking safe drinking water. MNWOO works to motivate private well owners and decision makers to take the individual and collective steps necessary to assure safe drinking water from all private wells for future generations.

Center for Food Safety (CFS) is a nonprofit environmental advocacy organization that aims to empower people and protect the environment from the harmful effects of industrial agriculture, including groundwater contamination from the concentration of industrial animal operations and their waste. CFS represents over a million members and supporters across the country, including over 9,000 members in Minnesota. CFS uses education, science-based advocacy, and litigation to address the negative environmental and public health effects of industrial agriculture.

Clean Up the River Environment (CURE) is a rural Minnesota nonprofit organization headquartered in the Minnesota River valley. CURE's mission is to protect and restore resilient rural landscapes and build vibrant, just, and equitable rural communities. CURE embodies three core practices: (1) awakening people's bonds with the natural world around them; (2) inclusively, strategically, and dialectically exploring issues and actions; and (3) systematically building communities of change at critical intersections of ecological and social wellbeing. Among CURE's values and guiding principles are that the capacity of communities to flourish is directly connected to the condition of the landscapes that embrace them; a moral responsibility to future generations to be good stewards of the ecosystems in which they live; and the human use

of natural resources can be regenerative and a sustainable force. CURE, with its rural roots, is aware that the Dakota and Ojibwe Nations and other rural communities, already culturally, socially, and politically marginalized, are often most impacted by climate change, clean water scarcity, and environmental degradation. While local control is important to CURE, it is equally important that there is accountability to all Minnesotans and to future generations. Because rural communities are frontline communities when it comes to pollution from industrial agriculture, CURE requests that EPA exercise its broad emergency powers, per the SDWA, to address groundwater contamination in southeastern Minnesota. Too often industrial agriculture is given a pass on protections for our land and water, putting profits over people. CURE asks EPA to step in and be a voice for those communities impacted by groundwater contamination.

Food & Water Watch (FWW) is a national, nonprofit membership organization that mobilizes regular people to build political power to move bold and uncompromised solutions to the most pressing food, water, and climate problems of our time. FWW uses grassroots organizing, media outreach, public education, research, policy analysis, and litigation to protect people's health, communities, and democracy from the growing destructive power of the most powerful economic interests. FWW has long advocated for stronger regulation of factory farm pollution and industrial agribusiness to protect farmers, rural communities, and the environment.

Friends of the Mississippi River (FMR) engages people to protect, restore and enhance the Mississippi River and its watershed in the Twin Cities region. FMR's water quality and drinking water protection work focuses on addressing agricultural contamination of surface water and groundwater with a goal of ensuring all Minnesotans have access to clean, safe, and healthy waters.

For over 100 years, the Izaak Walton League has fought for clean air and water, healthy fish and wildlife habitat, and conserving special places for future generations. It was the first conservation organization with a mass membership. Today, the League plays a unique role in supporting citizens locally and shaping conservation policy nationwide. The League is a grass roots member organization that has led efforts for clean water legislation achieving initial success with the passage of federal water pollution acts in 1948, 1956 and finally the Clean Water Act of 1972. The League continues to advocate for preserving wetlands, protecting wilderness, and promoting soil and water conservation. Its Save Our Streams (SOS) program involves activists in all fifty states in monitoring water quality. The Minnesota Division of the Izaak Walton League of America is composed of 16 chapters located throughout the state of Minnesota. The League's broader mission is to conserve, restore, and promote the sustainable use and enjoyment of our natural resources, including soil, air, woods, waters, and wildlife. More specifically in regard to groundwater, by a resolution passed at the 1988 Annual Meeting, the Division went on record pointing out the need for better protection and management of the state's groundwater. While some protections have been put in place at the state

level, it is clear that these have been inadequate. Greater federal protections are urgently needed.

Land Stewardship Project (LSP) is a private, nonprofit organization founded in 1982 to foster an ethic of stewardship for farmland, to promote sustainable agriculture, and to develop healthy communities. LSP is dedicated to creating transformational change in our food and farming system. LSP's work has a broad and deep impact, from new farmer training and local organizing to federal policy and community-based food systems development. At the core of all of LSP's work are the values of stewardship, justice, and democracy.

Minnesota Trout Unlimited (MNTU) is a nonprofit, nonpartisan conservation organization working to protect, restore, and sustain the watersheds and groundwater sources that support coldwater fisheries. For more than 60 years our members have advocated for clean water, both for recreational benefits and drinking. Minnesota trout streams are protected as Class 1 drinking water sources due to their close connection to groundwater. Nitrate contamination of southeast Minnesota groundwater and trout streams not only harms humans, but also the aquatic organisms on which these ecosystems depend. MNTU's several thousand Minnesota members regularly fish southeast streams and drink the water drawn from area aquifers.

Public Health Law Center (PHLC) is a nonprofit law and policy organization working to advance equitable public health policies through the power of law. For over 20 years, PHLC has fought to regulate and eliminate commercial tobacco, promote healthy food, support physical activity, and improve environmental health as a means of reducing chronic disease. PHLC partners with Tribal health leaders, federal agencies, health advocacy organizations, state and local governments, and many others to combat systems of institutional racism and create healthier communities across the country.

III. Legal Background

A. Safe Drinking Water Act

Congress enacted the SDWA as a powerful tool for protecting drinking water resources throughout the United States. Under the Act, EPA may delegate duties to state authorities to develop policies, regulations, and programs to ensure access to safe drinking water. On the federal level, the SDWA "requires EPA to protect the public from . . . drinking water contaminants."⁹

⁹ *City of Portland v. Env't Prot. Agency*, 507 F.3d 706, 709 (D.C. Cir. 2007).

States may apply for, and EPA may delegate, “primacy” to states, which shifts significant authority and responsibility to state officials to implement the SDWA.¹⁰ To assume primacy, the state is supposed to adopt regulations at least as stringent as EPA’s national requirements, develop adequate procedures for enforcement and levying penalties, conduct inventories of water systems, maintain records and compliance data, and develop a plan for providing safe drinking water under emergency conditions.¹¹ While a state granted primacy has responsibility to implement the SDWA’s provisions in that state, EPA retains emergency powers under Section 1431 of the SDWA to take actions necessary to abate imminent and substantial endangerment to the health of persons caused by drinking water contamination when state officials have failed to effectively do so on their own.

B. EPA’s Emergency Powers

For EPA to exercise its Section 1431 authority, two conditions must be met. First, EPA must have received “information that a contaminant which is present in or likely to enter a public water system or an underground source of drinking water . . . may present an imminent and substantial endangerment to the health of persons.”¹² Second, EPA must have received information that “appropriate State and local authorities have not acted to protect the health of such persons” in a timely and effective manner.¹³

1. Contaminant

The SDWA defines a contaminant as “any physical, chemical, biological, or radiological substance or matter in water.”¹⁴ While this broad definition does not require a substance to be regulated under the Act in order to be classified as a “contaminant,” nitrate is listed as a contaminant with an established maximum contaminate level (MCL) of 10 mg/L.¹⁵ An MCL is the “maximum permissible level of a contaminant in water which is delivered to any user of a public water system.”¹⁶ MCLs are promulgated after a determination by EPA based on the best available, peer-reviewed science and data that the regulation of the contaminant will reduce a threat to public health.¹⁷ Establishing

¹⁰ 42 U.S.C. § 300g-2; 40 C.F.R. §§ 142.10–142.19 (primacy enforcement responsibility).

¹¹ ELENA H. HUMPHREYS & MARY TIEMANN, CONG. RES. SERV., RL31243, SAFE DRINKING WATER ACT (SDWA): A SUMMARY OF THE ACT & ITS MAJOR REQUIREMENTS 7 (2021), <https://sgp.fas.org/crs/misc/RL31243.pdf>.

¹² 42 U.S.C. § 300i; *see also* U.S. ENV’T PROT. AGENCY, UPDATED GUIDANCE ON EMERGENCY AUTHORITY UNDER SECTION 1431 OF THE SDWA 8 (2018) [hereinafter EMERGENCY AUTHORITY GUIDANCE].

¹³ 42 U.S.C. § 300i; *see also* EMERGENCY AUTHORITY GUIDANCE, *supra* note 12, at 12-13.

¹⁴ 42 U.S.C. § 300f(6).

¹⁵ 40 C.F.R. § 141.62(b).

¹⁶ 42 U.S.C. § 300f(3).

¹⁷ 42 U.S.C. §§ 300g-1(b)(1)(A), (b)(3)(A).

nationwide, health-based MCLs is central to EPA's role in protecting drinking water under the SDWA.¹⁸

The MCL for nitrate was set at 10 mg/L to protect against blue-baby syndrome; however, recent studies have shown that even lower levels of nitrate can cause other health effects, including cancer and reproductive harm.¹⁹ For example, recent studies have found statistically significant increased risks of colorectal cancer at drinking water levels far below the current MCL of 10 mg/L.²⁰

2. Imminent & Substantial Endangerment

An endangerment from a contaminant is "imminent" if conditions that give rise to it are present, even if the actual harm may not be realized for years.²¹ Courts have established that an "imminent hazard" may be declared at any point in a chain of events that may ultimately result in harm to the public.²² Information presented to EPA need not demonstrate that residents are actually drinking contaminated water and becoming ill to warrant EPA exercising its Section 1431 emergency authority.²³ In other words, an actual injury need not have occurred for EPA to act, and to wait for such actual injury to befall the public would be counter to the precautionary intent behind the SDWA. Thus, while the threat or risk of harm must be "imminent" for EPA to act, actual and documented harm itself need not be.²⁴ While endangerments are readily determined to be imminent where MCL violations expose sensitive populations to a contaminant, contaminants that lead to chronic health effects may also cause "imminent endangerment."²⁵ In such cases, it is appropriate to consider the length of time a population has been or could be exposed to a contaminant.²⁶

An endangerment is "substantial" "if there is a reasonable cause for concern that someone may be exposed to a risk of harm."²⁷ For instance, Congress has deemed an

¹⁸ 42 U.S.C. § 300g-1(b)(4)(B).

¹⁹ See, e.g., Mary. H. Ward et al., *Drinking Water Nitrate and Human Health: An Updated Review*, 15 INT'L J. ENV'T RSCH. & PUB. HEALTH 1557 (2018); Alexis Temkin et al., *Exposure-Based Assessment and Economic Valuation of Adverse Birth Outcomes and Cancer Risk Due to Nitrate in United States Drinking Water*, 176 ENV'T RSCH. 108442 (2019).

²⁰ See, e.g., Jorg Schullehner et al., *Nitrate in Drinking Water and Colorectal Cancer Risk: A Nationwide Population-Based Cohort Study*, 143 INT'L J. CANCER 73 (2018).

²¹ EMERGENCY AUTHORITY GUIDANCE, *supra* note 12, at 8 (citing *United States v. Conservation Chem. Co.*, 619 F. Supp. 162, 193-94 (W.D. Mo. 1985)).

²² *Id.* n.15 (citing cases).

²³ See *Trinity Am. Corp. v. Env't Prot. Agency*, 150 F.3d 389, 399 (4th Cir. 1998).

²⁴ EMERGENCY AUTHORITY GUIDANCE, *supra* note 12, at 8.

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.* at 11.

endangerment sufficiently substantial where a substantial likelihood exists that contaminants capable of causing adverse health effects will be ingested by consumers if preventative action is not taken.²⁸ As with imminence, EPA has made clear that actual reports of human illness resulting from contaminated drinking water are not necessary to establish substantial endangerment.²⁹

C. Minnesota's Authority

Minnesota has several state agencies with jurisdiction over the quality of underground sources of drinking water: MDH, MDA, and MPCA are the primary ones. The graphic below shows the differing roles of these agencies.³⁰

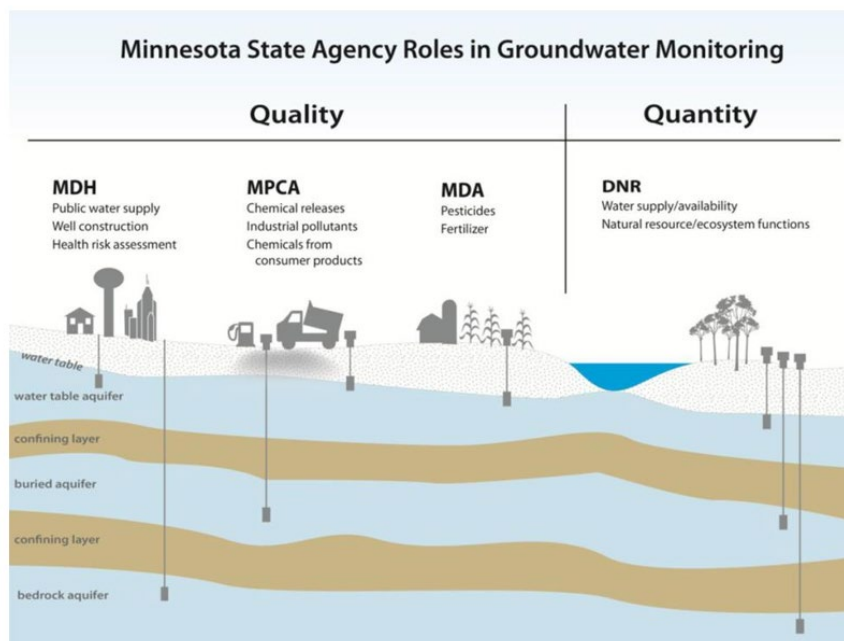


Figure 2: Agency Roles in Groundwater

²⁸ See H.R. REP. NO. 93-1185, at 35-36 (1974).

²⁹ See EMERGENCY AUTHORITY GUIDANCE, *supra* note 12, at 11 (citing *United States v. North Adams*, 777 F. Supp. 61, 84 (D. Mass. 1991)).

³⁰ SHARON KROENING & SOPHIA VAUGHAN, MINN. POLLUTION CONTROL AGENCY, CONDITIONS OF MINNESOTA'S GROUNDWATER QUALITY 2013-2017, 4 (2019), <https://www.pca.state.mn.us/sites/default/files/wq-am1-10.pdf> [hereinafter MPCA GROUNDWATER QUALITY 2013-2017]. The graphic also depicts the MDNR, which controls water appropriation and has a role in agricultural drainage projects that affect public waters. MDNR also conducts some groundwater monitoring as part of its County Geologic Atlas program.

The MDH administers the Minnesota Well Code for the construction of new wells and borings³¹ and Minnesota's SDWA.³² EPA granted Minnesota primacy under the federal SDWA in 1976.³³ Although the SDWA allows states to set higher standards than the federal minimum, Minnesota state law sets the drinking water quality standard for nitrate at the same level as the federal standard: 10 mg/L.³⁴ Public water systems with nitrate levels over 10 mg/L must notify people who receive water from them.³⁵

The MPCA's authority extends to discharges from point sources under its water pollution control laws.³⁶ Point sources include animal feeding operations, which, as discussed below, are a significant contributor of nitrate pollution to groundwater in the karst region. The MPCA regulates animal feeding operations with more than 1,000 animal units through the issuance of National Pollution Discharge Elimination System (NPDES) permits,³⁷ but smaller farms are unregulated. Finally, the MDA has statutory authority under the Minnesota Groundwater Protection Rule to regulate the use of pesticides and commercial fertilizer.³⁸

D. EPA's Authority in Minnesota

Despite Minnesota's primacy under the SDWA, EPA retains emergency powers to abate present or likely contamination of public water systems (PWS) or underground sources of drinking water (USDW) when such contamination poses an imminent and substantial threat to human health and the state "ha[s] not acted to protect the health of [endangered] persons."³⁹

EPA's Section 1431 authority extends to contaminated USDW and PWS that pose a threat to human health,⁴⁰ including sources that supply private wells.⁴¹ EPA defines USDW as an aquifer or part of an aquifer "(1) [w]hich supplies any public water systems; or (2) which contains a sufficient quantity of ground water to supply a public water system; and (i) currently supplies drinking water for human consumption."⁴² PWS are

³¹ MINN. R. 4725.0500–4725.7605.

³² MINN. STAT. §§ 144.381–144.387.

³³ MINN. DEP'T OF HEALTH, MINNESOTA DRINKING WATER ANNUAL REPORT FOR 2021 2 (2022), <https://www.health.state.mn.us/communities/environment/water/docs/report21.pdf>.

³⁴ MINN. R. 4720.0350 (adopting national standards by reference).

³⁵ MINN. STAT. § 144.385.

³⁶ MINN. STAT. § 115.03.

³⁷ MINN. R. 7020.2003, subp. 2(B).

³⁸ MINN. STAT. § 103H.275; MINN. R. 1573.0010–1573.0090.

³⁹ 42 U.S.C. § 300i(a).

⁴⁰ *Id.*

⁴¹ EMERGENCY AUTHORITY GUIDANCE, *supra* note 12, at 7-8.

⁴² 40 C.F.R. § 144.3.

aquifers that provide water for human consumption and “ha[ve] at least fifteen service connections or regularly serve[] at least twenty-five individuals.”⁴³ The drinking water for the hundreds of thousands of residents of the karst region of Minnesota comes from either private or community wells that rely on groundwater. The underground aquifers that supply these wells therefore qualify as USDW and PWS within the purview of the SDWA.

To abate endangerment to human health that arises despite a state’s efforts to curtail it, Congress authorized EPA to, among other things, issue “such orders as may be necessary to protect the health of persons who are or may be users of” the affected drinking water supplies and to commence civil enforcement actions against entities causing threats to public health by contaminating drinking water supplies.⁴⁴ Petitioners ask EPA to use that authority here.

IV. Drinking Water Contamination in the Karst Region Constitutes an Endangerment under the SDWA and Necessitates Emergency Action by EPA

Nitrate contamination in Minnesota’s karst region is a widespread issue that has stubbornly persisted through decades as state officials continuously fail to effectively address the problem. “Nitrate contamination of surface water and groundwater is a long-standing issue in the region. Impacts to municipal and private drinking water supplies by nitrate are widespread and well-documented.”⁴⁵ According to MPCA, “[t]rends from the past 10, 20, and 40 years show that statewide . . . nitrate concentrations have generally been increasing.”⁴⁶ Figure 3 is a MPCA graphic which shows that there are no areas of the state where nitrate trends in surface water have decreased between 2008 and 2017.⁴⁷ The main contributors to this problem are large-scale animal agriculture facilities and industrial row-crop agriculture which dominate land use within the area and that are not effectively addressed by existing regulations and policies promoting voluntary actions.

⁴³ 42 U.S.C. § 300f(4)(A).

⁴⁴ EMERGENCY AUTHORITY GUIDANCE, *supra* note 12, at Attach. 2.

⁴⁵ ANTHONY C. RUNKEL ET AL., GEOLOGIC CONTROLS ON GROUNDWATER AND SURFACE WATER FLOW IN SOUTHEASTERN MINNESOTA AND ITS IMPACT ON NITRATE CONCENTRATIONS IN STREAMS, MINN. GEOLOGIC SURV., 4 (2013) [hereinafter RUNKEL 2013].

⁴⁶ DAVE WALL ET AL., MINN. POLLUTION CONTROL AGENCY, 5-YEAR PROGRESS REPORT ON MINNESOTA’S NUTRIENT REDUCTION STRATEGY 17 (2020), <https://www.lrl.mn.gov/docs/2021/other/210420.pdf> [hereinafter 5-YEAR PROGRESS REPORT].

⁴⁷ *Id.*

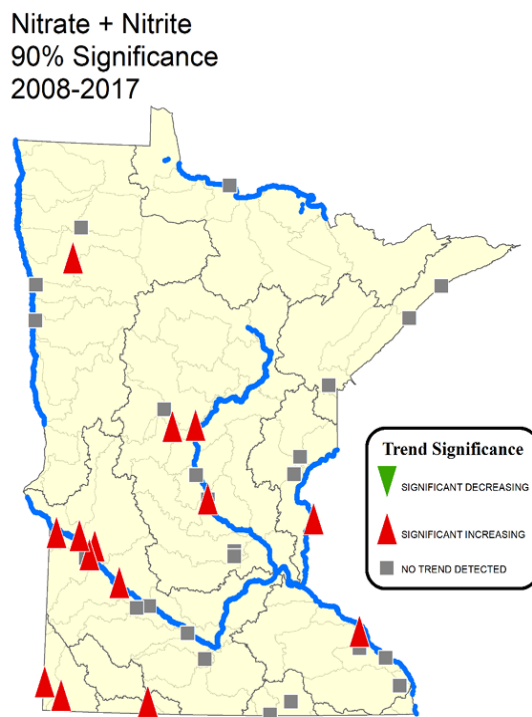


Figure 3: 5-year Progress on Nitrate

Emergency action by EPA is necessary to address the dangerous levels of nitrate in the karst region because the contamination poses an imminent and substantial risk to the health of more than 380,000 residents who rely on groundwater, and because Minnesota officials have failed to improve drinking water quality, despite knowing about the problem, for over 40 years.⁴⁸

A. The Karst Region is Particularly Susceptible to Nitrate Pollution

Groundwater in the karst region is vulnerable to contamination because of the fluid interaction between groundwater and surface water. The rapid movement of water in and out of the ground in this region leaves a blurry distinction between groundwater and surface water that is compounded by Minnesota's multi-agency approach to drinking water policies, regulation, and funding. Specific karst features such as stream sinks and sinkholes that inject water into the ground and the springs that discharge groundwater to the surface are depicted in Figure 4.⁴⁹ "[N]ot only does karst aquifer groundwater flow rapidly (flows have been measured in miles per day versus the inches, or feet, per year common to sandstones), but contaminants in the groundwater are not

⁴⁸ 5-YEAR PROGRESS REPORT, *supra* note 46, at 17.

⁴⁹ RUNKEL 2013, *supra* note 45, at Fig. 3.

readily filtered out. As a result, contaminants can reach domestic wells located miles from the source of contamination.”⁵⁰

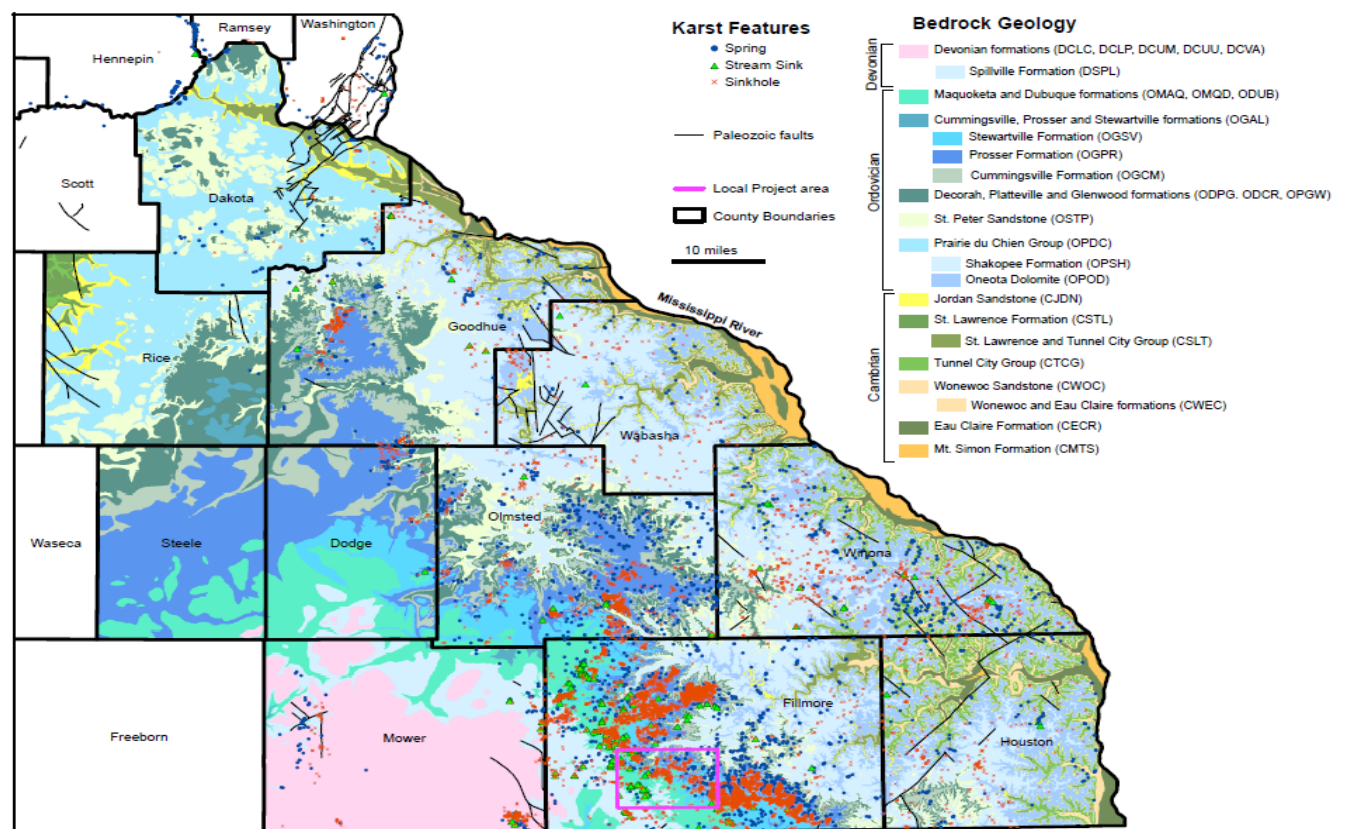


Figure 4: Karst Features

Nitrate pollution is particularly troublesome because nitrate is mobile in groundwater.⁵¹ Nitrate mobility in karst regions can be largely determined by rainfall frequency and intensity.

Recent research indicates that up to 80% of nitrate loading in karst regions can be traced to fertilizers that are quickly flushed from soils into the karst and groundwater

⁵⁰ JEFFREY ST. ORES ET AL., GROUNDWATER POLLUTION PREVENTION IN SOUTHEAST MINNESOTA'S KARST REGION, 465 UNIV. OF MINN. EXTENSION BULL. 6 (1982), https://conservancy.umn.edu/bitstream/handle/11299/169069/mn_2000_eb_465.pdf?sequence=1 [hereinafter ORES 1982].

⁵¹ MINN. POLLUTION CONTROL AGENCY, EFFECTS OF LIQUID MANURE STORAGE SYSTEM ON GROUNDWATER QUALITY 3 (2001), <https://www.pca.state.mn.us/sites/default/files/rpt-liquidmanurestorage.pdf>.

systems during rain events.⁵² Water carries the excess nitrogen from fertilizers on the surface through the soil column and into the fractured karst bedrock, where oxygenated conditions facilitate conversion of nitrogen to nitrate.⁵³ Combining nitrogen intensive land uses with the karst region's heightened vulnerability to nitrate contamination is a major hazard.

As a result, "[g]roundwater in uppermost bedrock units, especially on the karstic plateaus that dominate the landscape of southeastern Minnesota, is typically nitrate-enriched, with concentrations commonly between 5-15 ppm."⁵⁴ Rural communities are particularly at risk since private wells are more likely to draw from shallow aquifers than public water systems, which can pull water from deeper wells and multiple sources.⁵⁵

Minnesota officials have been aware of the vulnerability of this region for at least 80 years. "S.P. Kingston, a former Minnesota health official, noted in 1943 that the regional groundwater system in southeast Minnesota is particularly vulnerable to contamination from many sources."⁵⁶ And nitrate was identified as one of the contaminants of concern as early as 1982: "Many shallow wells in southeast Minnesota contain coliform bacteria and high nitrate levels—both indicators of possible contamination."⁵⁷ The evidence of nitrate contamination in the groundwater of this region is robust.

B. The Karst Region Has a Documented History of Nitrate Contamination

The karst region has an extensive history with nitrate contamination in groundwater aquifers. Although nitrate is a naturally occurring substance, the presence of nitrate in groundwater at concentrations above 3 parts per million or milligrams per liter is not natural and indicates an anthropogenic source of the nitrate.⁵⁸

⁵² Fu-Jun Yue et al., *Rainfall and Conduit Drainage Combine to Accelerate Nitrate Loss from a Karst Agroecosystem: Insights from a Stable Isotope Tracing and High-Frequency Nitrate Sensing*, 186 WATER RESCH. 116388 (2020), <https://doi.org/10.1016/j.watres.2020.116388>.

⁵³ PHILIP MONSON, MINN. POLLUTION CONTROL AGENCY, AQUATIC LIFE WATER QUALITY STANDARDS DRAFT TECHNICAL SUPPORT DOCUMENT FOR NITRATE 1 (2022), <https://www.pca.state.mn.us/sites/default/files/wq-s6-13.pdf>.

⁵⁴ RUNKEL 2013, *supra* note 45, at 59.

⁵⁵ *Learn About Private Water Wells*, ENV'T PROT. AGENCY (Mar. 1, 2023), <https://www.epa.gov/privatewells/learn-about-private-water-wells>.

⁵⁶ ORES 1982, *supra* note 50, at 3.

⁵⁷ *Id.*

⁵⁸ *Nitrate in Drinking Water*, MINN. DEP'T OF HEALTH (DEC. 8, 2022), <https://www.health.state.mn.us/communities/environment/water/contaminants/nitrate.html>.

Regular sampling of wells to detect nitrate began over 30 years ago. Fifty-five wells in Winona County were first sampled in 1990 and 1991.⁵⁹ Twenty-five of the well samples were taken from the shallower Prairie du Chien aquifer and 30 were from the deeper Jordan aquifer. “Nitrate concentrations exceeded the 10 mg/l drinking water standard in 48 percent of Prairie du Chien wells and 3.2 percent of Jordan wells.”⁶⁰ Fifteen to thirty years later, nothing had improved: testing data from wells sampled between 2005 to 2017 revealed that 49% of wells in agricultural areas of the state, installed near the water table, exceeded the MCL for nitrate.⁶¹

Petitioners present a compilation of data in this Petition that shows nitrate contamination in private wells in the karst region. The data were compiled by Petitioners EWG and MNWOO. In 2020, EWG used data from the Township Testing Program⁶² conducted by MDA, a Volunteer Nitrate Monitoring Network,⁶³ and new well tests required by MDH since the Well Code was adopted in 1975.⁶⁴ EWG used the data to create an interactive map showing nitrate contamination by township.⁶⁵ The Township Testing Program sampled and analyzed over 32,000 private wells between 2017 and 2020. The Volunteer Nitrate Monitoring Network in the karst region began in 2008 with a network of 675 private drinking water wells. “Between February 2008 and August 2018, 13 sampling events occurred representing 5,421 samples.”⁶⁶ And MDH provided EWG with location data and test results for each of the 45,598 wells sampled between 2009 and 2018.⁶⁷ Finally, MNWOO hosts well testing clinics that allow homeowners to test their

⁵⁹ David B. Wall & Charles P. Regan, *Water Quality and Sensitivity of the Prairie du Chien-Jordan Aquifer in West-Central Winona County, MINN.* POLLUTION CONTROL AGENCY, ES1 (1991).

⁶⁰ *Id.*

⁶¹ MPCA GROUNDWATER QUALITY 2013-2017, *supra* note 30, at 2, 15.

⁶² MINN. DEP’T AGRIC., TOWNSHIP TESTING PROGRAM UPDATE - MAY 2022 (2022), https://www.mda.state.mn.us/sites/default/files/docs/2022-05/ttpupdate2022_05.pdf (hereinafter TOWNSHIP TESTING UPDATE 2022).

⁶³ MINN. DEP’T OF HEALTH, VOLUNTEER NITRATE MONITORING NETWORK: METHODS AND RESULTS (2012), <https://www.health.state.mn.us/communities/environment/water/docs/swp/no3methods.pdf>.

⁶⁴ MINN. R. 4725.0500–4725.7605.

⁶⁵ *Interactive Map: Nitrate in Minnesota Private Drinking Water from Groundwater Sources (2009-2018)*, ENV’T WORKING GRP., <https://www.ewg.org/interactive-maps/2020-nitrate-in-minnesota-private-drinking-water-from-groundwater-sources/map/> (last visited Apr. 17, 2023).

⁶⁶ KIM KAISER ET AL., MINN. DEP’T OF AGRIC., NITRATE RESULTS AND TRENDS IN PRIVATE WELL MONITORING NETWORKS 2008-2018 2 (2019), <https://wrl.mnpals.net/islandora/object/WRLrepository%3A3395/datastream/PDF/view>.

⁶⁷ EWG Tap Water Report, *supra* note 7, at Methodology.

well water for nitrates and chlorides at no cost. MNWOO provided data from 119 different wells, from at least 24 townships from five counties in the karst region. To date, these data points do not appear in any other public record. The karst-region-specific data from these combined sources are depicted in Figure 5.

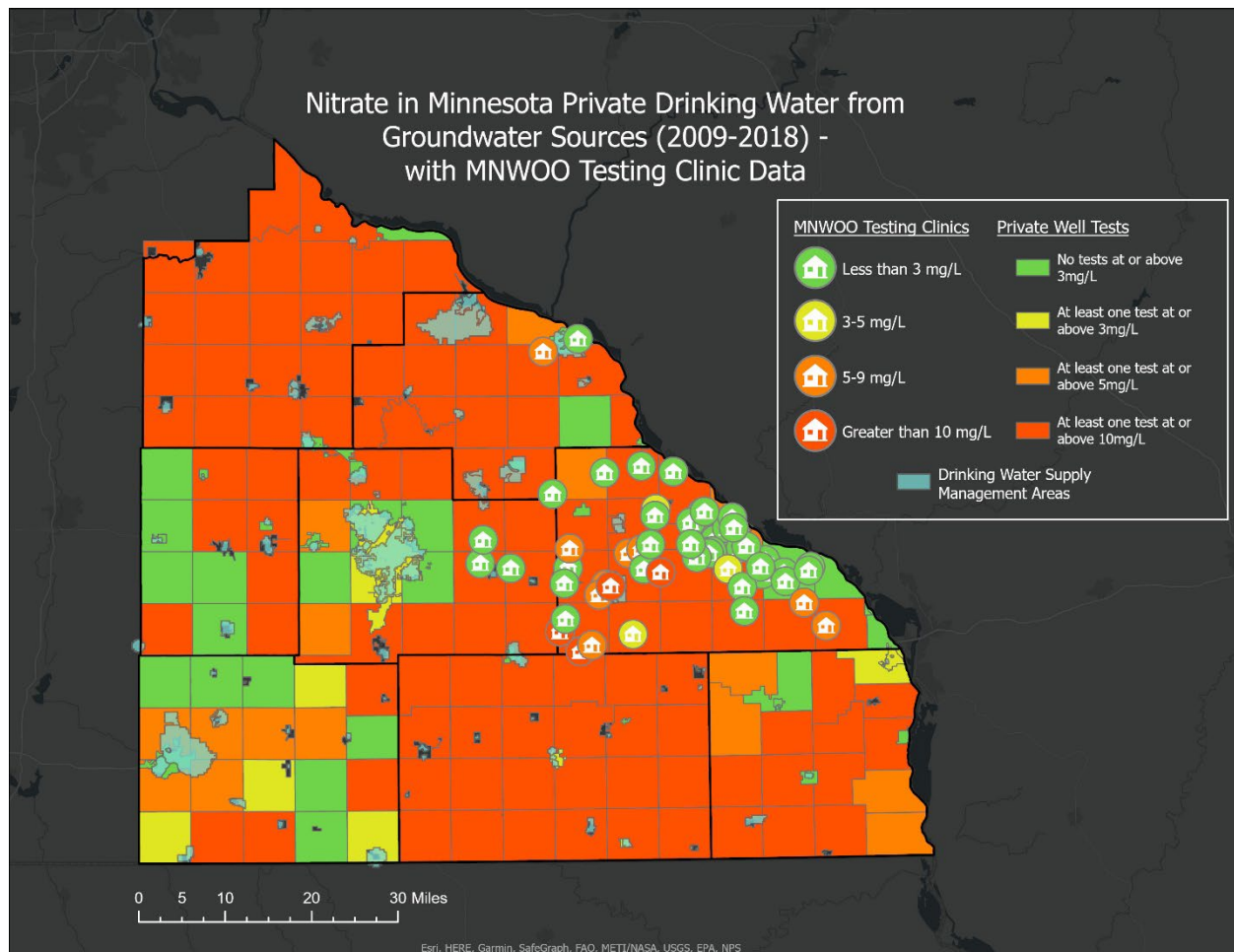


Figure 5: Private Well Contamination

Data from Township Testing Program, Southeast Volunteer Monitoring Network, MDH Well Index, and MNWOO clinic

Approximately 9% of the wells tested during the initial round of the Township Testing Program were found to have samples that exceeded the MCL for nitrate of 10mg/l. The multiple rounds of sampling and analysis also found a maximum nitrate concentration of 69.8 mg/L. The percentage of wells tested between 2008 and 2018 in the Volunteer Nitrate Monitoring Network (VNMN) above 10 mg/l ranged from a low of 7.5% in 2012 to a high of 14.6% in 2008. More recent data from the VNMN show that (among continuing participants) nitrate contamination continues: In 2019, 9% of wells

tested above 10 mg/l, in 2020 it was 9.4% and in 2021 it was 8.5%.⁶⁸ The MNWOO clinic conducted in the karst region in February 2023 showed a 6% rate of nitrate contamination above 10 mg/L.

Figure 5 also depicts the location of the wells in comparison to the Drinking Water Supply Management Areas (DWSMAs). DWSMAs are defined geographic areas around public water supply wells that represent a 10-year travel time for water to reach the well. These areas are used by MDH and local communities in developing Well Head Protection Areas and are the geographic limitation for MDA's ability to protect groundwater under the Groundwater Protection Rule from commercial fertilizers and pesticides. As figure 5 demonstrates, many of the private wells in this region fall outside of a protected DWSMA. EPA needs to step in to afford private well owners protection against nitrate contamination.

It is also important to note that despite the additional protection available to protect PWS, many community water supplies with 25 or more connections to a well and many transient community water supplies like churches, campgrounds, and businesses in the area, are also affected by nitrate contamination. Petitioner EWG has also compiled Minnesota well testing data into an interactive map for public water systems,⁶⁹ and presents a karst-specific version of that map in Figure 6.

⁶⁸ *Southeast Minnesota Volunteer Monitoring Network*, MINN. DEP'T OF AGRIC., <https://www.mda.state.mn.us/southeast-minnesota-volunteer-nitrate-monitoring-network> (last visited Apr. 17, 2023).

⁶⁹ *Interactive Map: Nitrate in Minnesota Public Drinking Water from Groundwater Sources (2009-2018)*, ENV'T WORKING GRP., <https://www.ewg.org/interactive-maps/2020-nitrate-in-minnesota-public-drinking-water-from-groundwater-sources/map/> (last visited Apr. 17, 2023).

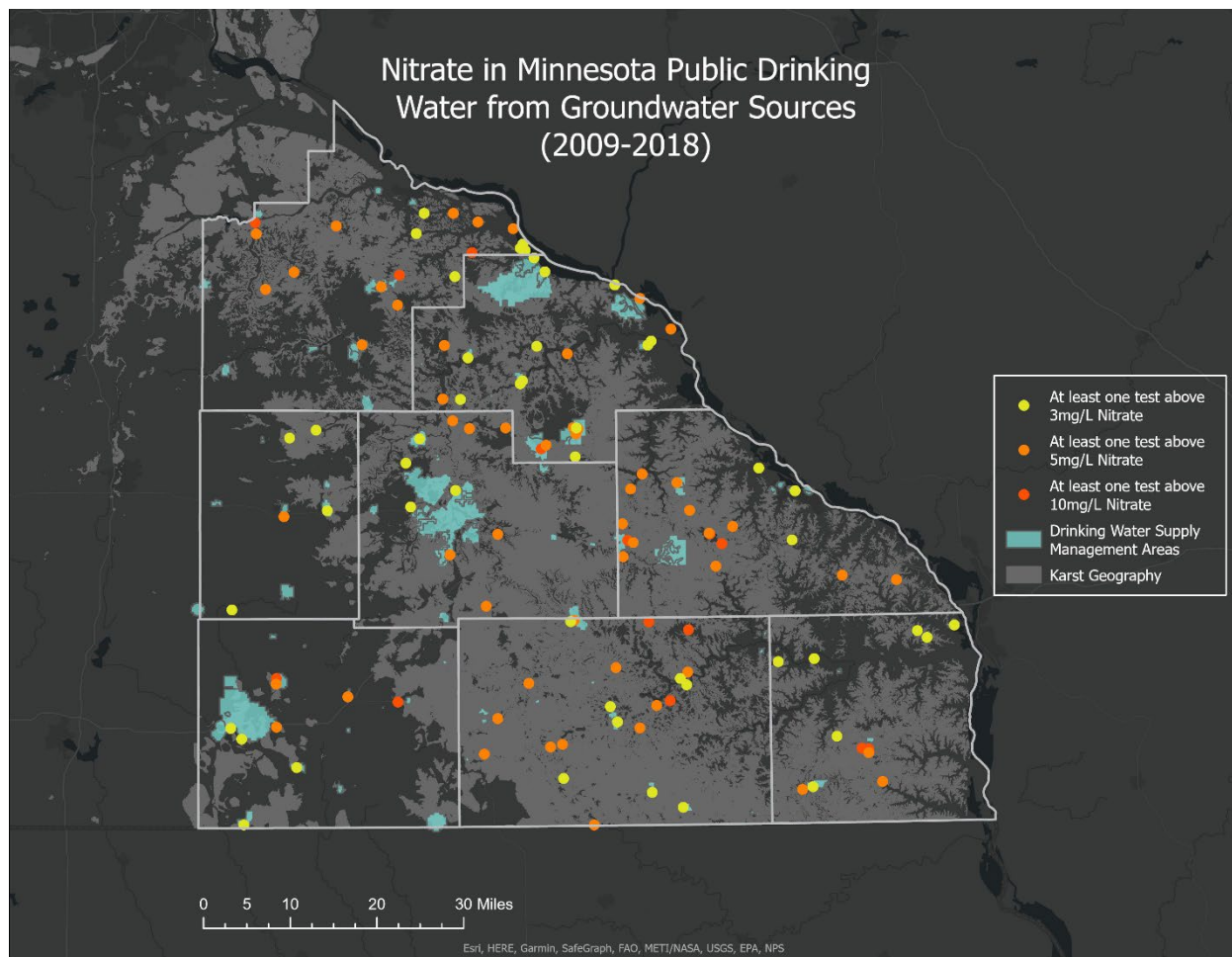


Figure 6: Public Drinking Water Contamination

In its 2020 analysis, EWG determined that groundwater-derived drinking water for an estimated 150,000 Minnesotans is contaminated with nitrate at levels over the legal limit. For 4,178 Minnesotans, the level is more than double the legal limit.⁷⁰ Cities in the karst region have long struggled with high nitrate concentrations in their drinking water. For example, the city of Lewiston has dug multiple deeper wells to try to eradicate nitrate from the city's water at a cost of approximately \$1 million per well.⁷¹ Had the city pursued a treatment system, the cost would have risen to \$3.1 million, and doubled water rates for residents.⁷²

⁷⁰ EWG Tap Water Report, *supra* note 7.

⁷¹ Elizabeth Baier, *Even in Region with Abundant Water, Residents Turn to Bottles and Try to Conserve*, MPR NEWS (Mar. 20, 2014), <https://www.mprnews.org/story/2014/03/20/ground-level-beneath-the-surface-southeast-minnesota>.

⁷² *Id.*

As another example, the city of Utica has two city wells, but as shown in the graph below, one well has been exceeding the 10 mg/L MCL since 2003 and is now for emergency use only. The other well, drilled in the late 1970s, began with a nitrate concentration of 3.9 mg/L, but that concentration has been steadily increasing and was as high as 8.6 mg/l in 2019.

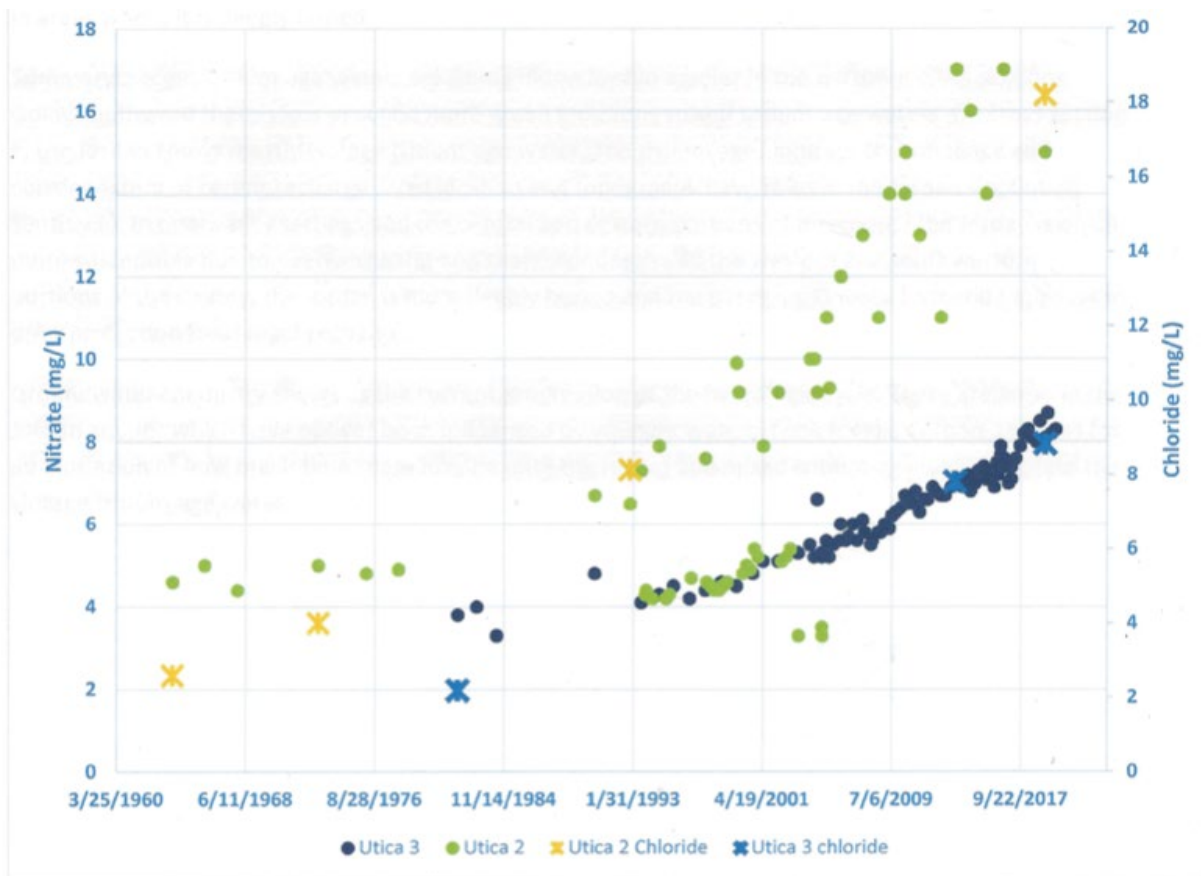


Figure 7: Utica City Well Contamination

Data from Minnesota Geological Survey

C. Under-Regulated Animal Feeding Operations and Industrial Row Crop Agriculture Are Dominant Land Use Activities and the Predominant Causes of Nitrate Contamination in the Karst Region

Most nitrate contamination in the karst region is caused by harmful agricultural practices on groundwater recharge areas that are not sufficiently addressed by Minnesota regulators. Despite evidence of adverse impacts on groundwater and public health caused by manure storage, the excessive or poorly timed application of manure, and animal feeding operations under MPCA, industrial row-crop agriculture under MDA, or the wellhead protections under MDH, Minnesota has had inadequate state and local regulation for decades, resulting in a public health crisis that requires emergency action

from EPA. The root cause of this pollution is public policy that makes polluting actions cheaper and easier than sustainable practices. The vast majority of farmers care deeply about stewardship of the land, but our policies do not reflect that same stewardship.

1. Animal Agriculture

Within the boundaries of Houston, Fillmore, Mower, Dodge, Olmsted, Wabasha, Winona, and Goodhue counties, there are currently approximately 3,170 animal feedlot operations that are required to register with MPCA's Feedlot program, with more added every year.⁷³ In addition, as depicted in the map below, many more feedlots are located in this area that fall below the number of animal units that require a permit or registration.

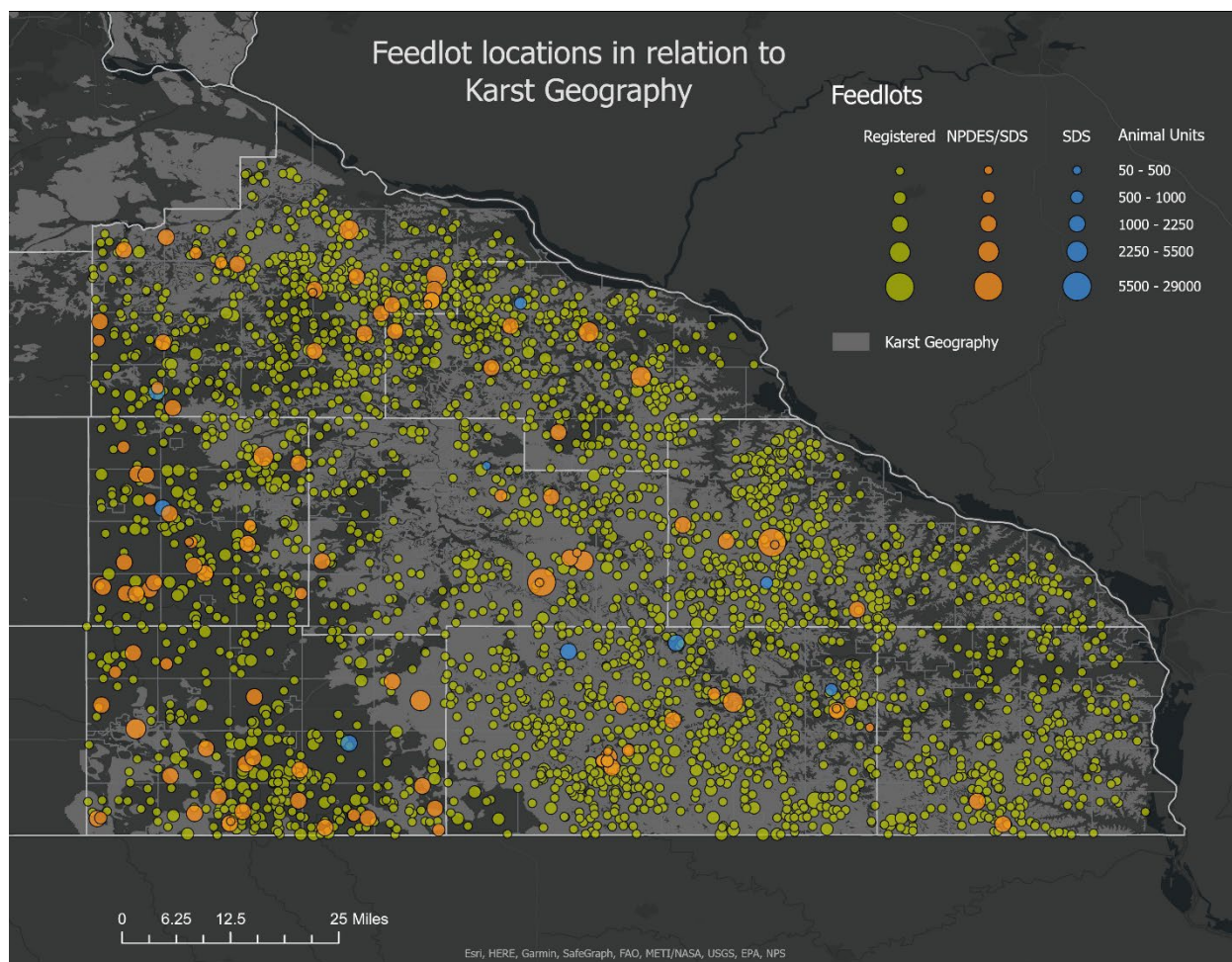


Figure 8: Karst Region Feedlots

Data from MPCA's Feedlots in Minnesota Database

⁷³ *Counties Delegated to Administer the MPCA Feedlot Program*, MINN. POLLUTION CONTROL AGENCY (Apr. 2022), <https://www.pca.state.mn.us/sites/default/files/wq-f1-12.pdf>.

The counties that are subject to this Petition house approximately 500,000 dairy cow and cattle animal units and another 260,000 swine units.⁷⁴ And the number of feeding operations statewide is on the rise.⁷⁵ Current feeding operations also continue to grow: in February 2023, the Fillmore County Board of Commissioners voted unanimously to increase the county's animal unit cap from 2,000 to 4,000 animal units per feedlot.⁷⁶ Moreover, almost 65% of the cattle units and over 37% of the swine units are located within landscapes designated as prone to surface karst feature development by MDNR. Those numbers jump to 96% and 69% respectively if we look at facilities within one mile of areas prone to the development of surface karst features.⁷⁷

The storage structures designed to contain millions of gallons of liquid manure, manure piles, and feedlot runoff, can also be significant sources of nitrogen to groundwater in this area.⁷⁸ Manure storage structures that are constructed in compliance with National Resource Conservation Service (NRCS) standards are actually designed to leak. According to the NRCS handbook, "properly" constructed lagoons can leak up to 5,000 gallons of manure wastewater per acre per day.⁷⁹ In one study conducted by MPCA, "[t]here was evidence of shallow ground water contamination down-gradient of manure storage areas at each [feedlot operation]."⁸⁰

⁷⁴ *Feedlots in Minnesota*, MINN. GEOSPATIAL COMMONS, <https://gisdata.mn.gov/dataset/env-feedlots> (last visited Apr. 17, 2023).

⁷⁵ Sarah Porter & Craig Cox, *Manure Overload: Manure Plus Fertilizer Overwhelms Minnesota's Land and Water*, ENV'T WORKING GRP. (May 28, 2020), <https://www.ewg.org/interactive-maps/2020-manure-overload/> [hereinafter *Manure Overload*].

⁷⁶ Brian Todd, *Fillmore County doubles its animal unit cap for feedlots*, AGWEEK (Mar. 1, 2023), <https://www.agweek.com/news/policy/fillmore-county-doubles-its-animal-unit-cap-for-feedlots>.

⁷⁷ *Minnesota Regions Prone to Surface Karst Feature Development*, MINN. GEOSPATIAL COMMONS, <https://gisdata.mn.gov/dataset/geos-surface-karst-feature-devel> (last visited Apr. 17, 2023).

⁷⁸ MINN. POLLUTION CONTROL AGENCY, EFFECTS OF LIQUID MANURE STORAGE SYSTEMS ON GROUND WATER QUALITY-SUMMARY REPORT (2001), <https://www.pca.state.mn.us/sites/default/files/rpt-liquidmanurestorage-summary.pdf>.

⁷⁹ U.S. DEP'T OF AGRIC. NAT. RES. CONSERVATION SERV., AGRICULTURAL WASTE MANAGEMENT FIELD HANDBOOK, CHAPTER 10: AGRICULTURAL WASTE MANAGEMENT SYSTEM COMPONENT DESIGN App. 10D-16 (2009), <https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=31529.wba> ("NRCS guidance considers an acceptable initial seepage rate to be 5,000 gallons per acre per day.").

⁸⁰ MINN. POLLUTION CONTROL AGENCY, EFFECTS OF LIQUID MANURE STORAGE SYSTEMS ON GROUND WATER QUALITY-SUMMARY REPORT 2 (2001), <https://www.pca.state.mn.us/sites/default/files/rpt-liquidmanurestorage-summary.pdf>.

In addition to the manure storage structures themselves, manure from livestock operations in the karst region is commonly used as fertilizer for row crops in the area. When liquified manure storage systems reach capacity, operators must empty them, often by disposing of the liquified manure and process wastewater onto nearby agricultural fields, regardless of the season. These land applications of manure are one of the largest sources of nitrogen from animal feeding operations.⁸¹

The karst region includes a number of townships, such as Utica and Fremont, that have sandy soils derived from sandstone bedrock. Applications of manure to sandy soils at high agronomic rates leave nitrogen in the soil after the growing season, which then leaches into the groundwater as nitrate, endangering public health.⁸² The townships with the highest percentages of private wells exceeding 10 mg/L nitrate concentration have sandy soils or thin soils over karst.

2. Industrial Agriculture

Another major contributor to the nitrate contamination is widespread industrial agriculture in the region. In the eight-county area, 73% of land cover is devoted to agriculture—60% is cropland and 13% is hay or pastureland.⁸³ This is a high concentration of agriculture for a sensitive karst landscape with a high sensitivity to groundwater contamination. In comparison, only 51% of Minnesota's land cover is devoted to agriculture statewide.⁸⁴ A significant portion of this southeastern Minnesota land is related to the animal agriculture in the region: it is used to grow feed crops for

⁸¹ *Estimated Animal Agriculture Nitrogen and Phosphorus from Manure*, ENV'T PROT. AGENCY (Jan. 11, 2023), <https://www.epa.gov/nutrient-policy-data/estimated-animal-agriculture-nitrogen-and-phosphorus-manure>.

⁸² Michael J. Goss et al., *Chapter Five—A Review of the Use of Organic Amendments and the Risk to Human Health*, 120 *ADVANCES IN AGRONOMY* 275 (2013), <https://doi.org/10.1016/B978-0-12-407686-0.00005-1> (“Spreading manure on the land in fall or winter results in smaller recovery of applied nitrogen by the crops, while the risk of surface runoff, leaching and denitrification is greater.”) (“Leaching losses of labeled N from the manure application were considerably greater than those from the original fertilizer application in all years.”).

⁸³ These percentages were calculated using the Multi-Resolution Land Characteristics National Land Cover Database Enhanced Visualization Analysis Tool, *see* MRLC NLCD EVA Tool, MRLC, <https://www.mrlc.gov/eva/> (last visited Apr. 17, 2023).

⁸⁴ *Agricultural Lands*, MINN. BOARD OF WATER AND SOIL RES., <https://bwsr.state.mn.us/agricultural-lands> (last visited Apr. 17, 2023).

animals⁸⁵ and/or receives the application of manure and waste from the nearby CAFOs as fertilizer.

But much of this fertilizer is over-applied. EWG's modeling found that in 69 of Minnesota's 72 agricultural counties, nitrogen from manure combined with nitrogen in fertilizer exceeded the recommended agronomic rates of MPCA and the University of Minnesota.⁸⁶ EWG identified 13 counties in Minnesota where the percent of Nitrogen, from fertilizer and manure combined, was more than 150% of the recommended amount needed to maximize crop yields.⁸⁷ Five of these 13 counties are in the karst region.⁸⁸ The total estimated nitrogen overload in these five counties is 26,424 tons per year.⁸⁹

The image below shows the coverage of corn and soybeans in the karst region along with average nitrate concentrations at areas near designated trout streams.⁹⁰

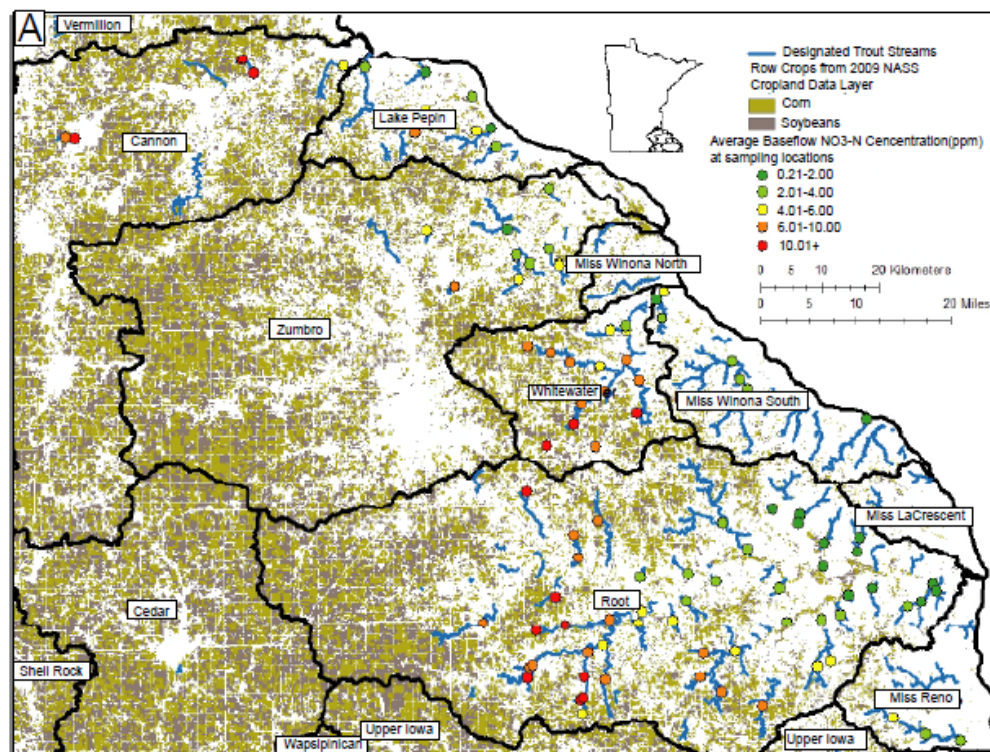


Figure 9: Industrial Agriculture and Nitrate-Contaminated Trout Streams

⁸⁵ Up to 40% of domestic corn use is allocated to livestock feed. See *Feed Grains Sector at a Glance*, U.S. DEP'T OF AGRIC., <https://www.ers.usda.gov/topics/crops/corn-and-other-feed-grains/feed-grains-sector-at-a-glance/> (last visited Apr. 17, 2023).

⁸⁶ *Manure Overload*, *supra* note 75.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Id.*

⁹⁰ RUNKEL 2013, *supra* note 45, at Fig. 37.

The correlation between land used to grow exclusively corn and soybeans and nitrate pollution is well documented. In a 2020 report, researchers at MDA found that the mean nitrate concentration of lysimeters placed on cropland that was in a constant corn or corn-soybean rotation was 22.3 mg/L.⁹¹ The figure below compares this to other land uses.

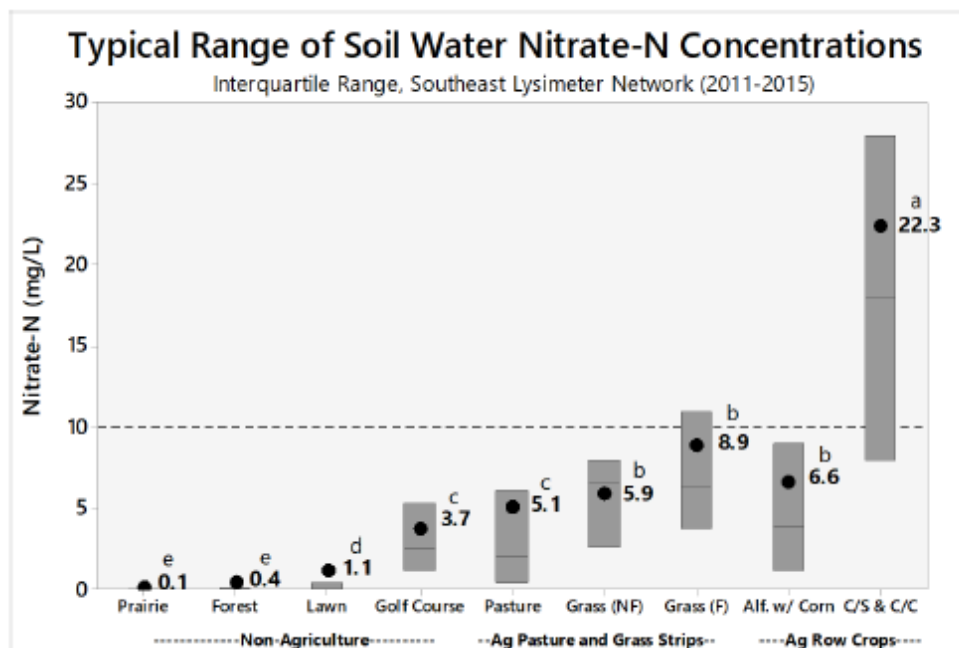


Figure 10: Land Cover and Nitrate Contamination

As Figure 10 demonstrates, industrial agricultural land suffers from significantly more contamination than other types of land uses generating a risk to both surface and groundwater.

D. Conditions in the Karst Region Constitute an Imminent and Substantial Endangerment to Human Health Under the SDWA

The current levels of nitrate in drinking water in the karst region present an imminent and substantial endangerment to human health because consumption of drinking water that is contaminated with nitrate is known to cause serious health risks. Given the thousands of individuals who rely on either contaminated private wells or

⁹¹ KEVIN KUEHNER ET AL., MINN. DEP'T OF AGRIC., EXAMINATION OF SOIL WATER NITRATE-N CONCENTRATIONS FROM COMMON LAND COVERS AND CROPPING SYSTEMS IN SOUTHEAST MINNESOTA KARST 14 (2020), <https://wrl.mnpals.net/islandora/object/WRLrepository%3A3654/datastream/PDF/view>.

contaminated PWS for drinking water in this region, there is reasonable cause for concern that individuals are, and will be, exposed to this risk at unhealthy concentrations.

Nitrate is plainly an endangerment to public health under the SDWA because EPA not only categorizes it as a “contaminant,”⁹² but as an “acute contaminant” known to pose significant health risks. According to EPA, “[n]itrate is an acute contaminant, meaning that one exposure can affect a person’s health. Too much nitrate in your body makes it harder for red blood cells to carry oxygen.”⁹³ EPA previously found that nitrate levels above the MCL of 10 mg/L present an imminent and substantial endangerment to human health.⁹⁴

Nitrate is a particularly insidious contaminant because it is colorless, odorless, and tasteless, meaning that people do not have a way of identifying its presence in their drinking water without testing.⁹⁵ MNWOO reports that at their testing clinics across the state, many of the people with high nitrate tests were unaware of the contamination and reported that they liked the taste of their well water.

Additionally, boiling nitrate-laden drinking water, as is often done in preparation of baby formula, increases the nitrate concentration of the water because nitrates do not evaporate and become more concentrated in the formula.⁹⁶ Shallower aquifers are both more likely to be used for private wells and are more contaminated. For example, in the karst region, the Prairie du Chien aquifer is shallower and much more nitrate contaminated than the deeper Jordan aquifer.⁹⁷ But deep wells can also be contaminated. For example, the well on the farm of one of MNWOO’s directors is a multi-aquifer well with a total depth of 400 feet, but the water from that well has exceed 13 mg/L nitrates for over 20 years.⁹⁸

⁹² 40 C.F.R. § 141.62(b).

⁹³ *Frequently Asked Questions About Nitrates & Drinking Water*, ENV’T PROT. AGENCY (Sept. 2012),

<https://nepis.epa.gov/Exe/ZyPDF.cgi/P10150PM.PDF?Dockkey=P10150PM.PDF>.

⁹⁴ See, e.g., Administrative Order on Consent, *In the Matter of Yakima Valley Dairies*, SDWA-10-2013-0080, at 7 (Mar. 19, 2013) (finding that “above the concentration of 10 mg/L in drinking water, nitrate may present an imminent and substantial endangerment to the health of persons”), <https://www.epa.gov/sites/default/files/2017-12/documents/lower-yakima-valley-groundwater-consent-order-2013.pdf>.

⁹⁵ *Nitrate in Drinking Water*, MINN. DEP’T OF HEALTH (Dec. 8, 2022), <https://www.health.state.mn.us/communities/environment/water/contaminants/nitrate.html>.

⁹⁶ *Frequently Asked Questions About Nitrates and Drinking Water*, ENV’T PROT. AGENCY (Sept. 2012),

<https://nepis.epa.gov/Exe/ZyPDF.cgi/P10150PM.PDF?Dockkey=P10150PM.PDF>.

⁹⁷ RUNKEL 2013, *supra* note 45, at 45.

⁹⁸ Jeffrey S. Broberg, MNWOO founder and board member, personal communication.

Drinking water contaminated with nitrate has well-documented adverse health risks including a variety of cancers, “blue-baby syndrome,” and reproductive problems.⁹⁹ Childhood brain cancer has been linked to high nitrate levels in drinking water.¹⁰⁰ MDH also reports other potential health effects such as “increased heart rate, nausea, headaches, and abdominal cramps.”¹⁰¹ Nitrate in water supplies has also been linked to spontaneous miscarriages and birth defects.¹⁰²

The numerous studies demonstrating that a contaminant known to cause disease and illness is present at unsafe levels in wells used by tens of thousands of residents proves an unambiguous SDWA “endangerment.”

Because the present contamination of the region’s drinking water and risk of significant adverse health effects from drinking contaminated water are both thoroughly documented, endangerment is clearly imminent. As explained above, endangerment is “imminent” if conditions that give rise to it are present, even if actual harm has not already been documented in the contaminated area. Unsafe levels of nitrate contamination in the karst region drinking water supply were first identified over 30 years ago,¹⁰³ and recent data trends indicate that nitrate contamination is continuing at a persistent – and harmful – level.¹⁰⁴

⁹⁹ *Nitrate in Drinking Water*, MINN. DEP’T OF HEALTH (DEC. 8, 2022), <https://www.health.state.mn.us/communities/environment/water/contaminants/nitrate.html>;

N. BEAUDET ET AL., NITRATES, BLUE BABY SYNDROME, AND DRINKING WATER: A FACTSHEET FOR FAMILIES, PEDIATRIC ENV’T HEALTH SPECIALTY UNITS (2014), https://ldh.la.gov/assets/opph/Center-EH/envepi/PWI/Documents/PEHSU_Nitrates_Consumer_1.20.15_FINAL.pdf; Roberto Picetti et al., *Nitrate and Nitrate Contamination in Drinking Water and Cancer Risk: A Systematic Review with Meta-Analysis*, 210 ENV’T RSCH. 112988 (2022), <https://www.sciencedirect.com/science/article/pii/S0013935122003152#bib109>.

¹⁰⁰ A. Zumel-Marne et al., *Environmental Factors and the Risk of Brain Tumours in Young People: A Systematic Review*, 53 NEUROEPIDEMIOLOGY 121 (2019), https://www.karger.com/Article/Fulltext/500601?utm_source=external&utm_medium=referral&utm_campaign=getFTR; see also, Yanqi Xu, *Nebraska’s Dirty Water*, THE READER (Oct. 28, 2022), <https://thereader.com/2022/10/28/nebraskas-dirty-water/> (“Areas of the state that have higher pediatric cancer rates and birth defect rates also have higher nitrate levels, researchers say.”).

¹⁰¹ *Nitrate in Drinking Water*, MINN. DEP’T OF HEALTH (DEC. 8, 2022), <https://www.health.state.mn.us/communities/environment/water/contaminants/nitrate.html>.

¹⁰² Allison R. Sherris et al., *Nitrate in Drinking Water during Pregnancy and Spontaneous Preterm Birth: A Retrospective Within-Mother Analysis in California*, 129 ENV’T HEALTH PERSPECTIVES, (2021), <https://ehp.niehs.nih.gov/doi/full/10.1289/EHP8205>.

¹⁰³ ORES 1982, *supra* note 50.

¹⁰⁴ TOWNSHIP TESTING UPDATE 2022, *supra* note 62.

The public health risks associated with nitrate contamination in the karst region constitute a “substantial” endangerment under the SDWA. According to EPA’s updated guidance on SDWA emergency authority, an example of substantial endangerment is “a substantial likelihood that contaminants capable of causing adverse health effects will be ingested by consumers if preventative action is not taken.”¹⁰⁵ Well sampling has consistently shown elevated nitrate levels in residential drinking water wells across the karst region. Thus, residents of the karst region have been, and continue to be, ingesting this contaminant. This alone demonstrates that the endangerment is substantial.

V. Minnesota Officials Have Failed to Achieve Safe Drinking Water Quality Despite Decades of Attempting to Implement Mitigation Plans

EPA should exercise its emergency authority under Section 1431 of the SDWA because users of USDW and PWSs in the karst region face imminent and substantial endangerment and actions by Minnesota officials have been ineffective. The chronology below describes state agencies’ recognition of, and attempts to address, the substantial and imminent endangerment posed by nitrate pollution. The persistent contamination despite these efforts demonstrates their ineffectiveness.

Minnesota enacted the Groundwater Protection Act in 1989. It was based on a growing recognition of the vulnerability of Minnesota’s groundwater resources.¹⁰⁶ In part, it was based on groundwater testing in the 1980s that showed nitrate levels exceeding the health limits in 40% of private wells tested and 7% of public wells.¹⁰⁷ It was followed closely by the development of the Nitrogen Fertilizer Management Plan by MDA in 1990.¹⁰⁸ Neither of these initiatives resulted in effective protection of Minnesota’s groundwater resources from nitrate pollution, as evidenced by the persistent contamination of private and public water supplies at or above the health risk limit.¹⁰⁹ In 2010, MDA began the process of revising the Nitrogen Fertilizer Management Plan.¹¹⁰ The updated Nitrogen Fertilizer Management Plan was finalized by MDA in 2015 and led to the Township Testing Program discussed above. One of the objectives for the Township Testing Program was to better grasp the extent and severity of the nitrate

¹⁰⁵ EMERGENCY AUTHORITY GUIDANCE, *supra* note 12, at 11 (explaining that an endangerment is substantial “if there is a reasonable cause of concern that someone may be exposed to a risk of harm”).

¹⁰⁶ JOHN HELLAND, MINN. H.R. RSCH. DEP’T, A SURVEY OF THE GROUNDWATER ACT OF 1989, (2001), <https://www.house.mn.gov/hrd/pubs/gdwtract.pdf>.

¹⁰⁷ *Id.*

¹⁰⁸ MINN. DEP’T OF AGRIC., NITROGEN FERTILIZER MANAGEMENT PLAN (2015, added July 2019), https://www.mda.state.mn.us/sites/default/files/2019-08/nfmp2015_addedada_0.pdf [hereinafter NITROGEN FERTILIZER MANAGEMENT PLAN].

¹⁰⁹ JOHN HELLAND, MINN. H.R. RSCH. DEP’T, A SURVEY OF THE GROUNDWATER ACT OF 1989, (2001), <https://www.house.mn.gov/hrd/pubs/gdwtract.pdf>.

¹¹⁰ NITROGEN FERTILIZER MANAGEMENT PLAN, *supra* note 108, at ix.

contamination problem – which it did. These data were used to inform the development of the Groundwater Protection Rule, which was passed in 2019 but falls short of the regulatory response needed to address the issue for the reasons documented below.

Also in 2010, the Minnesota Legislature approved funds for MPCA to develop aquatic life water quality standards for nitrate, in recognition of the need to protect Minnesota’s aquatic life from the toxic effects of high nitrate. In response, MPCA issued its Aquatic Life Water Quality Standards Technical Support Document for Nitrate, which recommended a chronic nitrate standard of 3.1 mg/L to be protective of aquatic life.¹¹¹ The MPCA did not adopt water quality standards for nitrate, however, and has continued to defer to that 2010 legislative mandate to this day.

In 2013, MPCA published a report titled “Nitrogen in Minnesota Surface Waters.” The report documents the widespread extent of nitrate contamination in Minnesota’s waters, noting that in southeastern Minnesota, there are several streams where “groundwater baseflow provides a continuous supply of high nitrate water to streams throughout the year.”¹¹² In other words, MPCA recognized that the groundwater in this area is so polluted, it is polluting the surface water.

In 2014, eleven Minnesota organizations jointly published a Nutrient Reduction Strategy for nitrogen and phosphorous pollution, led by MPCA.¹¹³ The goal was to ultimately reach Minnesota’s state water quality goals and downstream impacts like eutrophication in the Gulf of Mexico. In 2020, MPCA issued its 5-year progress report, considering whether the 2014 Nutrient Reduction Strategy was successful. The progress report shows that while phosphorous concentration trends in Minnesota waterways have generally decreased over the past 10-20 years, nitrate concentration trends have increased—in some major rivers by 20-60%. The Progress Report identifies row crop agriculture as the largest source of nitrogen.

Even with overwhelming data and analysis showing the trends and the reasons for concern, more recent strategies have been similarly ineffective. In 2019, MDA finalized

¹¹¹ PHIL MONSON, MINN. POLLUTION CONTROL AGENCY, AQUATIC LIFE WATER QUALITY STANDARDS TECHNICAL SUPPORT DOCUMENT FOR NITRATE (2010), <https://wrl.mnpals.net/islandora/object/WRLrepository%3A77>. Although MPCA’s regulatory focus has been on surface water, in the karst region the connection between surface and groundwater is so immediate, that surface water quality standards are highly relevant to protecting groundwater quality.

¹¹² MINN. POLLUTION CONTROL AGENCY, NITROGEN IN MINNESOTA SURFACE WATERS 3 (2013), <https://www.pca.state.mn.us/sites/default/files/wq-s6-26a.pdf>.

¹¹³ MINN. POLLUTION CONTROL AGENCY, THE MINNESOTA NUTRIENT REDUCTION STRATEGY (2014), <https://www.pca.state.mn.us/sites/default/files/wq-s1-80.pdf>.

the Groundwater Protection Rule, which has several deficiencies.¹¹⁴ For example, although fall application of commercial fertilizer is restricted in the karst region, as well as in identified DWSMAs, fall application of manure is not. There are other significant flaws in the rule that fail to adequately protect USDWs. First, the regulatory scope of the rule is limited to DWSMAs for community wells and provides no direct assessment or protection of private wells that fall inside a DWSMA and no assessment or protection for those outside of a DWSMA (see Figure 5 above). As both MCEA and MDH noted in comments on the Groundwater Protection Rule, the Rule should include a mitigation process for private wells and non-community public water supply wells that is equivalent to what it establishes for public water supplies.¹¹⁵ Without this equitable approach, MDH notes that the rule “does not serve the public health needs of rural Minnesotans, many of whom already suffer inequities relative to public health outcomes.”¹¹⁶ Second, there can be a significant lag time from days to years from the initial contamination of groundwater or surface water from sources of nitrogen and the necessary action taken by the state agencies to address the source. The MDA has the general authority to issue penalties for violations of its rules through Minnesota Statutes 18D, but the Groundwater Protection Rule requires a monitoring period that can last decades before enforcement actions are taken.¹¹⁷ Lastly, the rule only requires best management practices to be used once a water source reaches mitigation level 3 or 4 contamination and even then, MDA cannot require application rates below that recommended by the University of Minnesota’s Extension Services. Since the Groundwater Protection Rule went into effect, none of the DWSMAs with elevated nitrates have been classified at mitigation level 3 or 4, and thirteen mitigation level decisions have been “delayed for good cause.”¹¹⁸ This means that thus far, the Rule continues to rely on voluntary approaches that have not remedied the problem over the last several decades.

¹¹⁴ Attached to this Petition as Exhibit A is Petitioner MCEA’s Comment to MDA, which explains the deficiencies of the rule in greater detail.

¹¹⁵ Ex. A; *see also* Minn. Dep’t of Health Comment Letter on Proposed Minnesota Department of Agriculture Rules Governing Groundwater Protection, Add. 1 (Aug. 14, 2018), https://speakup-us-production.s3.amazonaws.com/uploads/attachment/file/5b746f627d79656b8800e3cb/MDH_GW_ProtRuleComments.pdf.

¹¹⁶ Minn. Dep’t of Health Comment Letter on Proposed Minnesota Department of Agriculture Rules Governing Groundwater Protection, at 2 (Aug. 14, 2018), https://speakup-us-production.s3.amazonaws.com/uploads/attachment/file/5b746f627d79656b8800e3cb/MDH_GW_ProtRuleComments.pdf.

¹¹⁷ MINN. DEP’T OF AGRIC., STATEMENT OF NEED AND REASONABLENESS IN THE MATTER OF PROPOSED PERMANENT RULES RELATING TO GROUNDWATER PROTECTION 131-133 (2018).

¹¹⁸ *Delayed for Good Cause: Drinking Water Supply Management Area Mitigation Level Determination*, MINN. DEP’T OF AGRIC., <https://www.mda.state.mn.us/delayed-good-cause> (last visited Apr. 21, 2023).

In 2021, MPCA released the final General NPDES Permit for CAFOs, which also has several deficiencies.¹¹⁹ First, there is no monitoring required to ensure that nitrate is not leaching from storage lagoons into groundwater or whether the land application practices are causing or contributing to water quality problems. Both of these practices are known to contribute nitrate to Minnesota's waters, and all NPDES permits are required to have conditions that assure compliance with applicable limitations.¹²⁰ Second, there is no prohibition on fall application of manure, and winter application of solid manure is allowed in December and January. There are also no controls on summertime application of manure on hayfields without incorporation into the sensitive soils of the karst region. Third, there is no required pre-plant testing for nitrate to ensure that farmers properly account for residual nitrates that remain from manure applied in previous years when they calculate expected crop nitrogen needs.¹²¹

The Minnesota Department of Health is charged with insuring that public water supplies meet drinking water standards and implementing wellhead protection measures.¹²² In a March 2021 report, MDH stated that "currently, there are approximately 400,000 acres in vulnerable groundwater Drinking Water Supply Management Areas," and that MDH's Source Water Protection Program "has a goal to protect vulnerable land in DWSMAs statewide by 2034."¹²³ However, the implementation of land use changes in Source Water Protection Plans is largely voluntary and does not protect underground sources of drinking water supply for private well owners who live outside of DWSMA boundaries. Finally, under the Minnesota Well Code MDH regulates private well construction and initial testing for nitrate and other pollutants like total coliform. However, "private drinking water testing and monitoring are otherwise unregulated and voluntary, with no formal tracking of water quality over time."¹²⁴

Most recently, in 2022, MPCA stated that it was still not going to develop water quality standards for nitrate pollution in surface waters used for recreation and aquatic

¹¹⁹ Attached to this Petition as Exhibit B is Petitioner MCEA's Comment to MPCA, which explains the deficiencies of the CAFO General Permit in greater detail.

¹²⁰ 33 U.S.C. § 1342(a)(2); *see also* 40 C.F.R. § 122.48(b), Minn. R. 7001.0150 subp.2B.

¹²¹ Ex. B at 22-23.

¹²² James Lundy et al., *Minnesota's 1989 Ground Water Protection Act: Legacy and Future Directions*, 5 MINN. GROUNDWATER ASSOC. (2022).

¹²³ *Protecting Vulnerable Drinking Water Sources*, MINN. DEP'T OF HEALTH (March 23, 2021), <https://www.health.state.mn.us/communities/environment/water/docs/cwf/vulnacres.pdf>.

¹²⁴ James Lundy et al., *Minnesota's 1989 Ground Water Protection Act: Legacy and Future Directions*, 5 MINN. GROUNDWATER ASSOC. 34 (2022).

life, despite the recognition that such a standard is necessary.¹²⁵ The State's repeated failures to mitigate nitrate levels in drinking water put more and more people at risk of drinking contaminated water. Allowing agricultural practices to continue in the karst region without meaningful changes to commercial fertilizer application, manure management, and manure disposal practices, will perpetuate the imminent and substantial endangerment to residents' health in direct violation of the SDWA. Although Minnesota officials have clear authority to adopt the mandatory regulations necessary to resolve the imminent and substantial endangerment, they have consistently refused to act. EPA must not let Minnesota officials continue to sit on the sidelines for another decade as the threat to the health of Minnesota citizens grows ever more severe.

VI. Requested Emergency Action to Abate Ongoing and Ever-Increasing Endangerment to Human Health from Nitrate Contamination

As discussed in detail above, the statutory prerequisites for emergency action under 42 U.S.C. § 300i are satisfied here. First, nitrate, which is a "contaminant" under the SDWA, is present in and continues to leach into USDW in the karst region. Second, the presence of nitrate contamination in groundwater is causing an imminent and substantial endangerment to public health; an alarming number of karst region residents rely on USDW that have been identified as carrying substantial nitrate risks for users. Finally, the State of Minnesota has not taken timely or effective action to abate the public health endangerment.

EPA has broad authority to investigate and remediate threats to public health under the SDWA. "Once EPA determines that action under Section 1431 is needed, a very broad range of options is available" as necessary to protect users of USDW.¹²⁶ The tools available to EPA include conducting studies, halting the disposal of contaminants that may be contributing to the endangerment, and issuing orders such as mandatory changes to manure generation, handling, and land application practices. In fact, "EPA may take such actions notwithstanding any exemption, variance, permit, license, regulation, order, or other requirement that would otherwise apply."¹²⁷

EPA should prioritize investigating and abating nitrate contamination in the karst region. Specifically, Petitioners respectfully request EPA take at least the following measures under its SDWA Section 1431 emergency powers, either by administrative order or through civil action:

¹²⁵ PHIL MONSON, MINN. POLLUTION CONTROL AGENCY, AQUATIC LIFE WATER QUALITY STANDARDS TECHNICAL SUPPORT DOCUMENT FOR NITRATE (2010), <https://www.pca.state.mn.us/sites/default/files/wq-s6-13.pdf>.

¹²⁶ EMERGENCY AUTHORITY GUIDANCE, *supra* note 12, at 14.

¹²⁷ *Id.* at 9.

Investigation and Risk Assessment:

- Conduct investigation and monitoring throughout the karst region to more accurately trace the sources and quantities of nitrogen pollution, and to identify which sources are causing nitrate contamination;
- Investigate MPCA's CAFO permit requirements and MDA's and MPCA's best management practices for nutrient management to determine why they have been unsuccessful at protecting groundwater in the karst region;

Engagement and Communication:

- Work with MDH to notify the public of the existing nitrate hazards and provide public updates throughout the process of returning drinking water to a safe condition;

Planning:

- Determine what enforcement measures should be implemented to effectively reduce nitrogen pollution from CAFO and industrial agriculture sources;
- Provide a timetable for implementing a remedy to abate nitrate contamination from identified contaminators;

Assistance:

- Order the parties responsible for the nitrate contamination to supply free water testing and ensure a free source of clean drinking water to residents of the karst region whose private wells or PWSs exceed safe limits for nitrate to prevent blue-baby syndrome, cancer, and other adverse health effects;
- Provide assistance to private well owners to engage in effective private well management practices;

Regulation:

- Prohibit CAFOs from opening, expanding, or modifying operations in the karst region unless and until nitrate concentrations in wells with historically high levels of nitrate consistently fall below the MCL of 10 mg/L;
- Require CAFOs and agricultural operators land-applying CAFO waste or other nitrogen fertilizers to modify their practices so that these operations will cease overburdening the area with nitrogen pollution via lagoon leakage, land application of manure, and/or spills and leaks.

The threat to public health in the karst region from nitrate pollution of groundwater is present and pervasive, and all signs indicate a continuation and exacerbation of dangerous contamination levels absent EPA action. Therefore, the

undersigned Petitioners respectfully request that EPA use its emergency powers under the SDWA to take the actions necessary to abate the sources of contamination that increasingly place the public at substantial risk and provide other forms of relief within its authority as long as the endangerment persists.

VII. Conclusion

In conclusion, for the reasons stated above, the undersigned Petitioners respectfully request that EPA invoke its emergency authority under Section 1431 of the Safe Drinking Water Act to urgently address the imminent and substantial endangerment to public health within the karst region of Minnesota caused by ongoing and increasing nitrate contamination. Please contact the undersigned for more information regarding this Petition.

/s/Carly Griffith

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Exhibit A



Minnesota Center for Environmental Advocacy

Using law, science, and research to protect Minnesota's environment, its natural resources, and the health of its people.

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August 15, 2018

Administrative Law Judge Jessica Palmer-Denig

**VIA ELECTRONIC
SUBMISSION**

Re: Proposed Rules Governing Groundwater Protection, Minnesota Rules, 1573;
Revisor's ID Number RD4337,
OAH Docket No. 71-9024-35205

Dear Administrative Law Judge Palmer-Denig:

This letter includes the comments of the Minnesota Center for Environmental Advocacy (MCEA) on the Minnesota Department of Agriculture's (MDA) Proposed Rules Relating to Water Resource Protection Requirements. MCEA is a Minnesota nonprofit environmental organization whose mission is to use law, science and research to preserve and protect Minnesota's wildlife, natural resources, and the health of its people. MCEA has statewide membership. MCEA is concerned about the impacts of agricultural pollution on Minnesota's waters and has been engaged with MDA on issues related to nitrogen fertilizer management for a number of years, including commenting on MDA's 2017 rule proposal.¹

MCEA has supported its comments with references with numerous published documents which are provided as exhibits to this letter.

I. INTRODUCTION AND SUMMARY OF POSITION

MCEA agrees that a rule to protect groundwater from nitrate contamination is needed: indeed, it is long overdue.² Documentation in the record supplied by the Minnesota Department of Agriculture ("MDA") establishes that the voluntary best management practices ("BMPs") have failed to reduce or stabilize nitrate concentrations in groundwater in many areas of the state, and that those

¹ A copy of MCEA's 2017 comment letter is included as an attachment.

² Chapter 103H was enacted in 1989, with the goal of preventing degradation of the groundwater by human activities. Where prevention is practicable, it is intended that it be achieved. Minn. Laws 1989, ch. 326, art. 1, section 1.

concentrations continue to grow. Even where fully adopted, the BMPs are not enough to reduce excessive nitrate levels where they already exist.³ More is needed.

MCEA supports the proposed fall and frozen soils application ban in “vulnerable areas” and in drinking water system management areas (“DWSMAs”) where N has exceeded 5.4 mg/L at any time in the past 10 years. However, the fall application ban part of the rule as proposed is riddled with convoluted and unsupported exclusions and exceptions which will make the fall application ban difficult to implement. Most importantly, the record shows that simply restricting the timing of nitrogen fertilizer application will not meet the statutory goals in those areas that are vulnerable to contamination. In fact, restricting the timing of application is one of the least effective of the University of Minnesota nitrogen fertilizer application recommendations.⁴ At the very minimum, the record shows that in these vulnerable areas of the state, all the University of Minnesota “recommended” practices, including rate, timing, source, and placement, must be mandated to have a significant impact on excessive nitrate levels, with a particular focus on the “right rate” of nitrogen fertilizer.⁵ And likely more actions must be required in order to prevent exceedances of the nitrate Health Risk Limit (“HRL”) in these areas.⁶

MCEA supports the issuance of Water Resource Protection Requirement orders (“WRPRs”) by the commissioner, but believes that the proposed rule too narrowly restricts the use of such WRPRs to public water supply system protection areas. Protection is also needed for people who drink well water. MCEA also believes that the proposed rule fails to provide adequate due process when a WRPR is issued: both “responsible parties,” and people who drink groundwater, must have the right to challenge the order.

Below, MCEA has provided alternatives that are supported by the record and that will not result in a substantially different rule within the meaning of Minn. Stat. § 14.05, subd. 2, but which will result in a rule that is in compliance with Minn. Stat. § 103H.275, subd. 1(c), by requiring water resources protection requirements that are “designed to prevent and minimize the pollution to the extent practicable” and, most importantly, are “designed to prevent the pollution from exceeding the health risk limits.”

The main issues with the rule are as follows.

A. The Proposed Rule Fails To Comply With Statutory Authority And Is Arbitrary Because It Does Not Protect People Who Drink From Private Wells

Persons who use water supplied by municipal or rural water supply providers are protected against drinking high nitrate levels by existing regulations requiring testing and which ensure a

³ This is not surprising because, while helpful in controlling nitrogen fertilizer-related pollution, the BMPs were developed from research based on yield optimization and the production economics of corn and not specifically on water quality indices. Randall, *Nitrogen BMP's for Corn in Minnesota* (provided in the exhibits).

⁴ Wall, *Nitrogen in Minnesota Surface Waters*, Minnesota Pollution Control Agency (June 2013). See also comments filed by Dr. Gyles Randall, August 1, 2018.

⁵ *Id.*

⁶ *Id.*

healthy water supply.⁷ When a community water supply well becomes contaminated, community water supplies typically have various options to deal with it.⁸ In contrast, people drinking from a private well may not test on a regular basis⁹ and suffer the same costs¹⁰—but with fewer options—when their water becomes contaminated. Despite these facts, the rule as proposed only protects persons who use water supplied by municipal or rural water supply providers.¹¹ The proposed rule should be amended to require mandatory requirements and WRPRs in township areas where excessive nitrate levels are present based on available test results. This change is supported by the record. Indeed, the MDA notes that it initially considered implementing regulatory actions “on the township level” in 2017, and further admits that in at least twenty townships more than 10% of the people who voluntarily sampled their wells are drinking water that exceeds the health risk limit for nitrate.¹² The only reason offered as to why townships with significant private well contamination levels were not included in the published rule is the lack of resources and a preference on the part of affected responsible parties to have the program stay voluntary.¹³ These reasons do not provide an adequate basis for the decision to abandon private well users and this decision is inconsistent with the MDA’s duty under Minn. Stat. § 103H.275, subd. 1(c)(1) and (2). Furthermore, the MDA has undermined its “limited resources” argument by noting that “the MDA will implement the voluntary parts of the 2015 NFMP in townships up to level 2, including forming [Local Advisory Teams] and conducting groundwater

⁷ The federal Safe Drinking Water Act standards apply to community water systems in Minnesota. See 42 U.S.C. § 300f et seq. The Safe Drinking Water Act standards are enforced by the Minnesota Department of Health. See <https://data.web.health.state.mn.us/drinkingwater>.

⁸ As noted by the Department of Health, community water systems can take a high nitrate well and reclassify it to only be used in case of emergency, remove the well from service, or seal the well so that it cannot be used again. While these strategies may appear to be more economical than adding a treatment process, there are still costs associated with each strategy - locating a new well site, drilling a new well, or treating for a different contaminant. See 2017 Annual Report at 15, available at <http://www.health.state.mn.us/divs/eh/water/com/dwar/report2016.pdf>.

⁹ According to the Minnesota MDA of Health, “Twenty-one percent of Minnesotans (1.2 million people) get their drinking water from a private well. Private well users are not afforded the same water quality safeguards as people who get their water from public water systems. While public water systems make sure water is safe for the end-user, private well users are responsible for making sure their water is safe for everyone in the household to drink.” <http://www.health.state.mn.us/divs/eh/cwl/wells/index.html>.

¹⁰ In 2008, average remediation costs were \$190 y-1 to buy bottled water, \$800 to buy a NO3 removal system plus \$100 y -1 for maintenance, and \$7,200 to install a new well. Lewandowski, A. M., Montgomery, B. R., Rosen, C. J., & Moncrief, J. F. (2008). *Groundwater nitrate contamination costs: A survey of private well owners*. Compare to increased public water supply costs cited in <http://www.house.leg.state.mn.us/comm/docs/CostofNitrateContaminationtoPublicSuppliers2007.pdf>.

¹¹ The attached map demonstrates how little area is *potentially* covered by the proposed rule (the black circled areas), as opposed to the areas where townships have already tested as having more than 5 percent wells above the HRLs.

¹² Statement of Need and Reasonableness dated April 30, 2018 (“SONAR”) p. 110.

¹³ *Id.*

monitoring.”¹⁴ It is unreasonable for MDA to prioritize its limited resources to require action to reduce nitrate contamination for public water supply users who are already guaranteed clean water over private wells owners who do not have such a guarantee. Moreover, if resources are limited, the MDA has non-arbitrary means for deciding how to allocate these resources, such as phasing in a program based on priorities, which this rule already identifies.¹⁵ MDA’s decision to abandon private well owners from the protections of the rule is arbitrary for the same reasons that the Minnesota Department of Labor and Industry was found to have acted arbitrarily in *Builders Ass’n of Twin Cities v. Minnesota Dept. of Labor and Industry*, 872, N.W.2d 263 (Minn. App. 2015). In that case, the Court of Appeals concluded that it was unreasonable for the Minnesota Department of Labor to adopt a building code that failed to require smaller homes to be protected by sprinkler systems where the record supported the potential for a phase-in of sprinkler requirement. MDA has not provided a reasonable basis for making WRPR protection available to only some of the millions of Minnesota residents who use drinking water as their major source of water – the nearly 30% of those residents excluded from these protections are those most in need. Private well users must be included; fundamental fairness compels nothing less.¹⁶

The following chart reflects a reasonable system to protect private well users from nitrogen fertilizer-related pollution which could be adopted as part of this rule in addition to the current provision protecting those who consume water from community drinking water sources:

Mitigation Level (“ML”)	Criteria	Required actions for the commissioner and responsible parties ¹⁷	Transition to higher level
1	At least 3 to less than 5% of private wells tested exceed the HRL within a township	Commissioner provides education and compliance resource information to all responsible parties within the township; Commissioner provides notice of opportunity to form a local advisory team (“LAT”). All responsible parties required to maintain and produce (on request) nitrogen fertilizer application records.	Exceed criteria for ML1.

¹⁴ SONAR p. 111.

¹⁵ See proposed 1573.0050, subp. 1, Item D (prioritization criteria for WRPRs).

¹⁶ MCEA refers MDA to the petition filed as a separate comment today, signed by close to 200 individuals, that asks MDA to protect the drinking water of individual well owners contaminated by nitrates, not just city water supplies.

¹⁷ MCEA also proposes, as discussed below, that the designation of a mitigation level area include certain reasonable actions that can be taken by responsible parties prior to the issuance of a WRPR. The actions shown in this chart are the same as those proposed by MCEA for the equivalent DWSMA mitigation level areas, creating a level playing field for responsible parties in DWSMA areas and township areas.

2	At least 5 to less than 10% of private wells tested exceed the HRL within a township	ML 1 actions; Responsible parties: • comply with no-risk nitrogen BMPs; • obtain yearly subsoil nitrogen samples (Nebraska program) and produce upon request.	Exceed criteria for ML2.
3	Greater than 10% of private wells tested exceed the HRL within a township	ML2 actions; Responsible parties: • develop and implement a nutrient management plan; • comply with all other actions required by the commissioner in a WRPR.	Exceed criteria for ML3.
4	Greater than 15% of private wells tested exceed the HRL within a township	ML3 actions; Responsible parties comply with all other actions required by the commissioner in a WRPR.	

B. The Rule Arbitrarily Prolongs Reliance On Voluntary Best Management Practices To Reduce Nitrates In Groundwater Despite Evidence That The Best Management Practices Have Not Succeeded In Controlling Nitrate Levels. Further, The Rule Allows The Voluntary Compliance To Continue For An Indeterminate Period Of Time

Initially, the rule allows the commissioner to establish only Mitigation Level (“ML”) 1 and 2 areas. In these areas, there are no mandatory requirements and WRPRs cannot be issued, despite the fact that in ML2 areas the water is predicted to exceed the health risk limit (“HRL”) in 10 years or has already had a reading in excess of the HRL. In the ML1 and 2 areas, MDA proposes only to try—again—to get responsible parties to use the nitrogen BMPs to control nitrate levels. This is manifestly unreasonable because the MDA has admitted in the SONAR that the existing nitrogen use BMPs have not proven to be a successful means for reducing nitrate levels, particularly due to adoption failure.¹⁸ Worse, the proposed rule prohibits the commissioner from evaluating the impact of the nitrogen use BMPs for “at least three growing seasons” or the “lag time,” whichever is longer. Lag times can be decades. The phrase “at least” is not limiting. As a result, the proposed rule unreasonably and arbitrarily allows the commissioner to prolong this monitoring period, potentially for decades, regardless of whether the nitrogen use BMPs have been implemented and regardless of whether nitrate levels continue to increase in the subsoil.¹⁹ Thus, voluntary activities can be continued for an endless period of time, regardless of result.

¹⁸ SONAR part IV, pp. 49-59.

¹⁹ Proposed rule 1575.0040, subp. 7, Items G and H allow the commissioner, with unfettered discretion, to postpone mandatory actions for an additional 3 or more growing seasons if the commissioner determines that the “responsible parties...have demonstrated progress in

The MDA cannot have it both ways. The MDA cannot continue to rely on voluntary BMP compliance while admitting that voluntary compliance has not been effective. If the MDA believes one last voluntary period is justified, then that period must be carefully limited by the rule and not be subject to extension. The commissioner should react to the data—not BMP compliance—to determine when more action is needed.²⁰

Further, MCEA believes that the record supports a decision to require responsible persons in all areas where elevated nitrate levels are detected (both for public and private wells) to require compliance with certain reasonable requirements such as recordkeeping *before* a site specific WRPR is issued, in particular in areas where exceedance of the health risk limit is statistically likely to occur.

The following table shows reasonable criteria for establishing mitigation levels for areas served by public wells and private wells. This table also shows reasonable actions that MDA could require responsible parties to take prior to WRPR issuance. MCEA believes these actions are needed and reasonable to ensure that the goal of the Groundwater Protection Act—to *prevent* groundwater from exceeding HRLs—is met.

Mitigation Level (“ML”)	Criteria	Required Actions for Commissioner and Responsible Parties	Transition to higher level
1	One reading of 3.0 mg/L or greater in a public water supply well(s) At least 3 to less than 5% of private wells tested exceed the HRL within a township	- Commissioner provides education and compliance resource information.²¹ - Commissioner provides notice of opportunity to form a local advisory team (“LAT”). - All responsible parties required to maintain and produce (on request) nitrogen fertilizer application records.	ML 1 stays a ML1 so long as it does not meet the criteria for a ML2.

addressing nitrates...” or if there is a “significant change in land use in a drinking water supply management area.” Neither “demonstrated progress” nor “significant change” are defined in any manner that would allow a party to determine with any certainty what these statements mean. The lack of enforceability of these rule provisions contravenes the statutory goals and is unsupported by the record.

²⁰ Although MDA suggests that it is required by statute to “evaluate” BMP adoption before it can issue a WRPR, Minn. Stat. § 103H.275 says nothing about evaluation of BMP adoption before a WRPR can be issued. Instead, the statute indicates that the contents of a WRPR—the requirements in the WRPR—must be based on “the use and effectiveness of best management practices.” The BMPs already exist. If the BMPs have been effective, they can be included in the WRPR. If they have not been effective, they should not be included in the WRPR. But in any event, BMP adoption levels are not mandated as a pre-condition for issuance of a WRPR.

²¹ This would include providing the recommended BMPs for the area.

2	One reading of 5.4 mg/L or greater in a public water supply well(s). At least 5 to less than 10% of private wells tested exceed the HRL within a township	All ML1 activities plus: • All responsible persons required to obtain yearly subsoil nitrogen samples (Nebraska program) and produce upon request.	ML2 becomes a ML3 if statistics show HRL will be exceeded in 10 years.
3	One reading of 7.0 mg/L or greater in a public water supply well(s). Greater than 10% of private wells tested exceed the HRL within a township	All ML 2 activities plus: • The No-risk Nitrogen Fertilizer Use BMPs. • Compliance with a Nutrient Management Plan. • [Commissioner issues WRPR based on priority criteria.]	ML3 becomes an ML4 if the health risk limit is exceeded.
4	One reading of 8.0 mg/L or greater in a public water supply well(s). Greater than 15% of private wells tested exceed the HRL within a township	All ML 3 activities plus: Commissioner issues a WRPR based on priority criteria that must include AMTs.	

Neither recordkeeping²² nor subsoil sampling are presently included in the rule as actions that responsible parties should take at lower mitigation levels, yet these actions would provide the commissioner information that the commissioner could use to determine whether BMPs are being complied with and are being effective, and would not be costly.²³ The sampling is reasonable because it is currently conducted by Nebraska producers and others.²⁴ Recordkeeping is reasonable because compliance with the BMPs requires recordkeeping, and any producer applying nitrogen fertilizer (or their agent or consultant) would be required to have such records.²⁵ The requirement for responsible parties in ML3 areas to comply with nitrogen fertilizer BMPs and nutrient management plans immediately upon triggering the ML3 designation is reasonable because these actions will not significantly increase costs for the

²² Recordkeeping is only required after a WRPR is issued. *See* 1573.0060, Item A(1).

²³ In fact, many Minnesota producers are already keeping such records and taking such samples. *See* testimony of Zach Johnson and Richard Syverson, July 25, 2018.

²⁴ *See Id.*; SONAR p. 122.

²⁵ *See* <http://www.mda.state.mn.us/nitrogenbmps>.

responsible parties,²⁶ and it may take some time for the commissioner to develop and issue a WRPR. In the interim, because the health risk limit may shortly be exceeded, it is reasonable to require the responsible parties to take immediate actions to better document and control nitrogen fertilizer use.

C. The Rule Lacks Adequate Due Process When The Commissioner Issues A WRPR Order, And Limits The Commissioner's Discretion To Include Effective Conditions

Although the rule requires notice to be given to affected persons prior to issuance of a WRPR as required by statute, only “responsible persons” subject to the order can seek review, which is unfair to the affected persons drinking the water. All persons impacted by the WRPR must be provided an opportunity for administrative and judicial review. Further, no standard is stated in the rule against which the commissioner’s decision will be judged to determine whether it meets the standards of the statute. The rule should—at a minimum—require that a WRPR “prevent and minimize the pollution to the extent practicable” and be “designed to prevent the pollution from exceeding the health risk limits.”²⁷ Finally, the review process lacks basic standards necessary to limit frivolous appeals, and appears to confuse “contested case hearings” with “public hearings.”

D. The Rule Unreasonably Limits The Commissioner's Discretion To Require Actions That Would Reduce Nitrogen Concentrations Where Necessary To Ensure That The Health Risk Limit For Nitrate Is Not Exceeded

The proposed rule fails to require the commissioner to include certain basic content that should be required in the WRPR, including monitoring, record-keeping, reporting, and the like. But more importantly, the proposed rule limits the commissioner’s authority to require certain actions in a WRPR that are immediately effective to reduce nitrogen—alternative management tools—just because the alternative management tool might cost money to implement. Similarly, the proposed rule limits the commissioner’s authority to require any changes to the “primary crop” and limits the use of nitrogen fertilizer to levels below rates the University of Minnesota has identified as the most profitable. Although undefined, it would appear that this provision would limit the commissioner’s ability to require, for any area for any time, a different crop to be grown (say alfalfa as part of a rotation on a particular field), as part of a WRPR. These limitations are unreasonable and unsupported by the record and do not meet the goals stated in Minn. Stat. § 103H.275. Instead, if there is a particular requirement that would cause hardship for a responsible party to implement, the commissioner should have the authority to enter into a two-year schedule of compliance that would allow a regulated party to make the necessary adjustments to come into compliance.

E. The Rule Contains Many Provisions That Provide The commissioner Too Much Discretion, As Further Described Below

The rule uses the phrase “as determined by the commissioner” in four places and the phrase “if the commissioner determines” in seven places. This language does not meet the standard for a

²⁶ Throughout this record it is noted that compliance with nitrogen BMPs may save producers money.

²⁷ Minn. Stat. § 103H.275, subd. 1(c)(1)(2).

rule, because it vests the decision in the commissioner without establishing a standard or a process. For example, all areas where “exclusions” can be established from the ban on fall nitrate fertilizer application are “as determined by the commissioner.” This fails to meet the standard for administrative rules, which cannot allow excessive and unfettered discretion such that a party is unable to determine how the rule will be applied. The Administrative Law Judge must reject a rule if it “is not a “rule” as defined in Minnesota Statutes, section 14.02, subdivision 4, or by its own terms cannot have the force and effect of law.”²⁸ This rule cannot be determined by its own terms, because it relies on decisions by the commissioner based on unstated criteria in many provisions. In fact, this lack of standards for WRPRs makes it extremely difficult to determine whether the rule will have any positive impact – the commissioner could rely on exclusions and issue WRPRs that include very minimal requirements (there is no stated standard for the commissioner’s WRPR order, just a list of potential options that could be included in a WRPR), and implement the rule in a manner that contradicts the goals of the Groundwater Protection Act.

F. The Rule Contains Many Provisions That Are Fatally Vague, As Further Described Below

For example, the proposed rule does not establish a deadline in part 1573.0040, subpart 2, for the commissioner to designate a DWSMA as a mitigation level 1 or 2 following receipt of information from the Department of Health (“MDH”) that a public well has exceeded a trigger level as set forth in subpart 3. To be enforceable, the rule must establish a deadline for the commissioner to act, i.e., within 60 days of receipt of information from MDH.

In addition to the above, the rule contains numerous provisions that are poorly drafted and should be fixed to ensure that the rule can be enforced.

II. FACTUAL AND LEGAL BACKGROUND

A. Nitrogen Fertilizer Use And Nitrate Contamination In Minnesota

The following are the underlying facts pertaining to these proposed rules that must be taken into consideration in evaluating whether the proposed rule meets the statutory standard.

Despite MDA’s years of promoting compliance with the University of Minnesota nitrogen fertilizer use recommendations, nitrogen fertilizer sales in Minnesota skyrocketed by nearly 200,000 tons/year from 1990 to 2016, including a 15% increase over the past 5 years.²⁹ In addition the acreage of crops that “leak” nitrogen fertilizer into groundwater, corn and soybeans, are consistently expanding, with over 4 million more leaky acres today than in 1990.³⁰

The result is widespread nitrate contamination of groundwater in Minnesota’s agricultural landscapes. Nearly half of the wells in MDA’s shallow groundwater monitoring network exceed

²⁸ Minn. R. 1400.2100 (g).

²⁹ MDA Draft Nitrogen Fertilizer Rule Presentation, at slide 24, found at <http://www.mda.state.mn.us/~media/Files/chemicals/nfmp/nfrpresentation.pdf> (last visited Aug. 14, 2018).

³⁰ *Id.* at slide 25.

the nitrate Health Risk Limit (“HRL”) of 10 mg/L.³¹ Where shallow wells are contaminated, deeper wells also are likely contaminated.³²

The Minnesota Department of Health reviewed data for 2014 – 2015 from Minnesota’s public water supply wells across the state and found that 537 of 10,519 (5.11 percent) had nitrate levels above 3 mg/L. These include wells for both communities and for businesses, schools, and organizations that provide water to the public.³³

The Minnesota Department of Agriculture’s Township Testing Program (“TTP”) provides testing for nitrate to homeowners who have wells in vulnerable areas of the state where groundwater used for drinking water can be affected by agricultural production. As of March 2018, 242 vulnerable townships from 24 counties participated in the TTP from 2013 to 2017. In the 242 townships tested, 113 (47%) have 10% or more of the wells over the HRL for Nitrate-N. Overall, 10.1% (2,583) of the 25,652 wells voluntarily tested exceeded the HRL for Nitrate-N.³⁴

And these numbers are expected to rise: changes to cropping practices can be expected to result in an increased risk of nitrogen loading.³⁵

B. Statutory Requirement For WRPRs

The Groundwater Protection Act of 1989 has the goal of preventing groundwater degradation.³⁶ For agricultural chemicals and practices, including the use of nitrogen fertilizer, the statute is implemented by the MDA, and requires MDA to evaluate the detection of agricultural pollutants in the state’s groundwater;³⁷ monitor groundwater for pollutants found to be of “common detection” as the result of normal use of a product or practice;³⁸ develop voluntary, practicable measures that are capable of preventing and minimizing degradation of groundwater from agricultural chemicals and practices, called BMPs;³⁸ and promote and evaluate the use and effectiveness of these BMPs.³⁹

³¹ *Id.* at 2-83.

³² In 2010, MDA installed eight new wells in the Central Sands Region, approximately 10-15 feet deeper than existing shallow well sites. *Id.* at 2-75. 75% of these wells exceeded the Health Risk Limit. *Id.* at 2-83.

³³ *Minnesota Drinking Water 2017*, Annual Report for 2016, Minnesota Department of Health Environmental Health Division Section of Drinking Water Protection, available at <http://www.health.state.mn.us/divs/eh/water/com/dwar/report2016.pdf>

³⁴ <http://www.mda.state.mn.us/~media/Files/chemicals/nfmp/tpupdate201806.pdf>

³⁵ Keeler and Gourevitch et al, *The Social Costs of Nitrogen*, Sci. Adv. 2016, at 6. The mechanisms are graphically explained at http://www.bwsr.state.mn.us/practices/farm-bill/FBAP_Winter_Meeting/2015/Estimating_the_External_Costs_of_Nitrogen_Fertilizer_in_MN.pdf.

³⁶ Minn. Stat. § 103H.001.

³⁷ Minn. Stat. § 103H.251, subd. 1. 13 Minn. Stat. §§ 103H.251, subd. 1(b) and 103H.005, subd. 5.

³⁸ Minn. Stat. §§ 103H.151, subd. 2 and 103H.005, subd. 4.

³⁹ Minn. Stat. §§ 103H.151, subd. 3 and 103H.275, subd. 1.

If implementation of BMPs proves ineffective, the Act provides MDA with the authority to adopt mandatory water resource protection requirements (WRPRs) that include “design criteria, standards, operation and maintenance procedures, practices to prevent releases, spills, leaks, and incidents, restrictions on use and practices, and treatment requirements.”⁴⁰ WRPRs may be statewide or targeted, but those that are not statewide become effective only in areas designated by order of the MDA Commissioner.⁴¹ WRPRs must be intended to prevent and minimize groundwater pollution to the extent practicable; be designed to “prevent the pollution from exceeding the health risk limits;”⁴² and be based on “the use and effectiveness of best management practices, the product use and practices contributing to the pollution detected, economic factors, availability, technical feasibility, implementability, and effectiveness.”⁴³ Although economic factors can be considered in decisions, these factors do not trump the overall goals established for the Act and cannot be paramount in view of overarching state policy in support of maintaining the resources of the state for the use of future generations.⁴⁴ Further, economic considerations cannot be limited to just those related to the cost to the responsible party; MDA must consider the cost of not acting on the affected public, who must pay to replace contaminated water supplies, as noted above.

Where this rule does not meet the intent of Groundwater Protection Act, MCEA requests that the Administrative Law Judge recommend changes to the rule that will ensure that it meets the minimum goals of the Groundwater Protection Act, in particular that the actions “prevent the pollution from exceeding the health risk limits” rather than allowing the status quo to continue, as that status quo has not succeeded in reducing impacts from nitrogen fertilizer to the groundwater as required by law.

III. MDA’S PROPOSED RULE: DETAILED PART BY PART ANALYSIS

MCEA provides detailed comments on the proposed rule below. In addition, MCEA has prepared a separate redline document of the proposed rule (attached). The proposed redline language addresses the problems identified in the proposed rule language and includes MCEA’s proposed language.

A. DEFINITIONS (1573.0010):

1573.0010, subp. 2. Alternative management tools (“AMTs”) are “specific practices and solutions described in part 1573.0090, subpart 1. . .that are approved by the commissioner to address groundwater nitrate problems,” but in fact no specific practices are described in the referenced part. Instead, the referenced subpart merely indicates that the commissioner will post a list. Based on the SONAR, the AMTs are intended to “go beyond the nitrogen fertilizer BMPs” and could be identified by the local advisory teams, and could include a variety of management

⁴⁰ Minn. Stat. § 103H.005, subd. 15.

⁴¹ Minn. Stat. § 103H.275, subd. 2(c).

⁴² Minn. Stat. § 103H.275, subds. 1-2.

⁴³ Minn. Stat. § 103H.275, subd. 2(a).

⁴⁴ In addition to the Act, Minn. Stat. § 116D.02 makes clear that economic impacts are not more important than the value of preserving natural resources for future generations.

practices. Because the commissioner may allow these practices to substitute for nitrogen fertilizer best management practices,⁴⁵ the rule must define all the practices that would be approvable AMTs and establish a standard for new practices that might not be currently known. As currently drafted, the rule is too vague and provides too much unfettered discretion to the commissioner in allowing the unknown AMTs to substitute for mandated best management practices.

Needed definition: Health Risk Limit or HRL. The definitions should reference the particular health risk limit at Minn. Stat. § 103H.201 because this term is used throughout the rule and has a particular meaning.

Needed definition: Interested Person. To simplify references to public notice procedures, MCEA recommends that the commissioner define “interested persons” as those who have registered with the department to receive public notices concerning actions of the commissioner under the rule.

1573.0010, subp. 12. The definition of lag time is limited to areas “being monitored.” The definition is too restrictive. Areas that have been monitored in the past will have an established lag time. It is unclear who is performing the monitoring referenced in this definition. Lag time should be defined to include all areas where data is adequate to support a determination of how long it takes for nitrogen fertilizer applied at the surface to enter the groundwater.

1573.0010, subp. 14. The rule must establish a process by which members of a “local advisory team” (“LAT”) are “approved” by the commissioner and the definition should reference that process, or the rule should establish that the LAT must have a certain constitution, but does not require “approval” by the commissioner. The rule must better define the role of the LAT.

1573.0010, subp. 17. For the purpose of this rule, it does not make sense to use additional concepts from Minn. Stat. § 18C.215, which is a chapter designed for the regulation and control of the manufacture, distribution, and sale of fertilizer in this state. The intent of this rule is to ensure that the MDA can regulate agricultural practices that are leading to excess nitrate levels, and the definition of nitrogen fertilizer must reflect all fertilizers that are applied to supply nitrogen. The MDA should amend this definition to simply reference the statutory definition.

1573.0010, subp. 18. Subpart 18 defines a “public well” as a “community water system” which includes permanent (but not necessarily municipal) water supplies. MCEA supports this definition, but notes that the definitions of municipal public water supply well, and public well, as used in the rule, create confusion. The rule should cover all drinking water supply management areas that have been established to protect public water supplies, whether municipal or non-municipal. There is no basis under this rule for a distinction.

1573.0010, subp. 19. It is unclear why this definition restricts soil tests to those conducted by or under the direction of the commissioner within a drinking water supply management area. Residual soil nitrate tests should include any tests conducted under appropriate controls in any area by any person. MCEA recommends striking the phrase “conducted by or under the direction

⁴⁵ See Minn. R. 7040.0040, subp. 6 (evaluation of BMP adoption as part of determination of whether a “level 2” mitigation area continued).

of the commissioner” from this definition. The phrase “that are representative” will prevent non-standard test results from being considered. MCEA recommends that MDA reference a standard method of obtaining results from soil testing.

B. FALL AND FROZEN SOILS VULNERABLE AREAS BAN (1573.0030):

This part of the rule establishes a ban on application of nitrogen in areas with vulnerable soils in the fall and when there are frozen soil conditions. However, part 1573.0030, subp. 2 and subp. 3 establishes numerous exclusions and exceptions that undermine the intent of the ban. MCEA supports the ban, but does not agree with the language that allows the commissioner excessive discretion.

1573.0030, subp. 1. The proposed provision contains an odd wording. A DWSMA is not “from” a municipal public water supply well. The rule should state that the water supply management area is “established for” a public water supply well. Item A (3)(b) needs to be worded in a similar fashion, i.e., reference that it is a drinking water supply management area established for a public water supply well with (or “which has had”) nitrate-nitrogen levels greater than or equal to 5.4 mg/L at any point in the previous ten years. DWSMAs are established for public wells that are not municipal. MCEA believes that all public wells should be included.

1573.0030, subp. 1, Item C. Item C indicates that a responsible party in charge of cropland depicted on the commissioner’s map is subject to the prohibition on fall application that is stated in part A. This sets up a potential conflict between the criteria in part A and duty to comply with the map in part C. It is important that the map not undermine the prohibition in part 1573.0030, Subp. 1, Item A. If Item A says “a responsible person shall not,” then Item C, which states that “any responsible person is subject to Item A,” is not needed.

1573.0030, subp. 2. Exclusions.

In general, this section of the proposed rule is drafted in a convoluted manner that makes it difficult to understand. However, closely read, the “exclusion” section appears to remove a significant portion of the vulnerable and DWSMA areas⁴⁶ subject to the prohibition on fall application based on certain broad soil (“leaching index”) and climactic (“frost-free”) assumptions. In Item G, the proposed rule also authorizes the commissioner to allow, based on unstated criteria and without any process whatsoever, fall applications in areas within a high-reading DWSMA if the commissioner believes “that the area is not contributing significantly to the contamination of the well” in the drinking water supply management area. Thus, the overall impact of Subpart 2 is to undermine the protection provided by prohibiting fall application of nitrogen fertilizer in vulnerable areas and threatened drinking water supply management areas.

The “exclusions” allow fall application of nitrogen fertilizer based on frost-free dates “in the county or a portion of the county” and a “leaching index” of various levels.⁴⁷ Later, however, the proposed rules state (Item B) that the exclusion applies to the entire county if a condition is represented on 50 percent or more of the land area of the county, but (Item C) commissioner can

⁴⁶ MCEA notes that MDA has proposed to correct this section to include DWSMA areas.

⁴⁷ The proposed rule states that the “leaching index” is “determined by the commissioner,” but the definition of “leaching index” references the gridMet dataset for 1981-2010.

also subdivide a county by geographical boundary “if there is a clear change in conditions represented in a specific area of the county,” but there is no description of what this “clear change in conditions” might be, or how the commissioner will make this determination or announce this determination. Finally, as noted above, the proposed rule appears to limit the exclusions to areas that are not drinking water supply management areas “with nitrate-nitrogen levels greater than or equal to 5.4 mg/L.”⁴⁸ It is unclear whether these areas are the same as the areas subject to the fall application prohibition, which are stated to be those with a well having “nitrate-nitrogen levels greater than or equal to 5.4 mg/L at any point in the previous 10 years.” Even so, as previously noted, this “exception to the exclusion” is undermined by Item G, which broadly allows the commissioner to exclude high-reading DWSMAs without any particular criteria for such an exclusion being set forth, nor any process by which the commissioner will exercise this authority.

The SONAR demonstrates that the MDA has proposed these exclusions based on the notion that cooler spring soils, combined with lower leaching indices, would result in reduced risk of groundwater contamination. However, although the MDA documents that it “heard many concerns from farmers in the western and northern parts of the state about the importance of fall nitrogen applications because of the short application window in the spring,”⁴⁹ there is little evidence of *scientific support* for the theory advanced by the MDA cited in the SONAR. No peer-reviewed or published articles are cited as support for the two-factor theory. One can only conclude that the MDA put the exclusions into this rule not on the basis of science, but instead because “there are logistical problems such as with an insufficient numbers (sic) tender trucks and spreaders to complete all fertilizer applications in this compressed spring period.”⁵⁰

If the MDA’s theory that cooler spring temperatures and a reduced leaching index is scientifically based, MCEA would support removing areas that have these characteristics from the fall application ban area. However, the language creating the exclusion areas must be clear and not subject to the discretion of the commissioner, as detailed below.

1573.0030, subp. 2, item E. This Item appears intended to exclude non-agricultural counties, but references the wrong “Item A.” The exclusion should be for *subpart 1*, Item A.⁵¹

1573.0030, subp. 2, items F and G. These are both problematic because they are vague. In Item F, what does it mean for a point source to be “a significant source” of N contamination? In Item G, the rule fails to specify the criteria that the commissioner will use to determine that the area is “not contributing significantly” to the N problem. Both of these exclusions are too vague to be enforceable unless amended. They both allow the commissioner free-rein to determine that an area will not be subject to the fall nitrogen prohibition, without any possibility of review. And

⁴⁸ As above, it is assumed that this reference is to the wells in the drinking water supply management areas.

⁴⁹ SONAR p. 97.

⁵⁰ SONAR p. 98.

⁵¹ MDA has identified this as a needed change in an errata document published on the MDA website.

such discretion is unnecessary: state law already provides a variance procedure that a person needing relief can use if the application of the rule is unreasonable as applied to the person.⁵²

1573.0030, subp. 3. Exceptions.

The MDA asserts that these exceptions are needed because they are a “necessary agricultural practice.”⁵³ MCEA supports the requirement that the fall application allowed by the rules must be consistent with the BMPs or the rates in the Fertilizer Guidelines published by the University of Minnesota Extension.⁵⁴ However, in a number of cases, the information presented in the SONAR undermines the assertion that the exceptions are needed as a necessary agricultural practice.

For example, for item 2, the SONAR states that, for pasture fertilization, “an early spring nitrogen application is the recommended timing.” The fall application exception is only necessary, apparently, if the producer is seeking a “high yield system,” and then only ¼ of the application is to occur in the fall, a limit which is not reflected in the exception.⁵⁵ As a result, a reasonable “exception” would be “when nitrogen fertilizer is required for a high yield pasture, provided that only ¼ of the yearly application is made in the fall.” Similarly, for item 4, grass seed production, the cited reference indicates that “either a fall application or very early spring application is recommended.”⁵⁶ As a result, fall application is not a necessary practice. Where fall application is a necessary practice, it should be done by October 1 to get plant root uptake of the nitrogen.

Item C is arbitrary as drafted. The SONAR notes that when farmers are adding phosphorus to fields, it generally is formulated with up to 40 pounds per acre of nitrogen and applied in the fall for use over two seasons. The Item states that “notwithstanding subpart 1” and “in addition to item A” (it is assumed that rule intended to reference *Subpart 2, Item A*), fall application is allowed so long as the applied N rate does not exceed an average of 40 pounds per acre in a field. However, without explanation, the rule then allows more than 40 pounds per acre (without any upper limit whatsoever), if a soil analysis demonstrates that the fields have “low to very low phosphorus levels.” Although the SONAR argues that this exception will be temporary, the language in the rule does not reflect any temporal limit. No scientific information is provided to explain what the impact of this exception would be on soil nitrate levels. Because (as noted in the SONAR), there are other methods to increase P where needed, this exception is arbitrary and

⁵² See Minn. Stat. §§14.055-.056. For example, a farmer who applies nitrogen in the fall using techniques and equipment that ensure that leaching does not occur might be able to apply to the commissioner for a variance from the fall application ban, on the ground that it is unreasonable under the unique site conditions and techniques being used. The commissioner, in granting such a variance, could agree so long as the farmer continued to use the techniques and documents the results.

⁵³ SONAR p. 102.

⁵⁴ Proposed rule, 1573.0030, Subpart 3, Item B. It would appear that this document is no longer available on the internet, making it difficult to check the references.

⁵⁵ SONAR p. 103.

⁵⁶ *Id.*

undermines the intent of the rule. Only the first part of the phosphorus-related exception is justified.

C. DRINKING WATER SUPPLY MANAGEMENT AREA; MITIGATION LEVEL DESIGNATION (1573.0040).

This part of the rule establishes the preconditions for the issuance of “water resource protection orders” or “WRPRs.” This part provides various duties for the commissioner: establishing mitigation level areas (“MLs”); “determining” BMPs; monitoring; and evaluating. The rule requires no actions by responsible parties until WRPRs are issued. The rule is unreasonable and will not meet the goals of the Groundwater Protection Act where it continues voluntary actions in areas where nitrate levels threaten to exceed the HRL. The rule is defective because it fails to establish a clear deadline for an ML2 to move to a ML3, a level at which the commissioner could issue a WRPR. In particular, MCEA believes that the current rule language, which allows unlimited “evaluation time” for a ML2, is unreasonable and not supported by the record.

MDA has the authority to require, by rule, statewide actions applicable to areas where specific evidence exists of the threat of public (and private) well contamination and should use this authority to establish reasonable conditions, such as recordkeeping, sampling, and nutrient management planning, that apply where a threat has been documented and a “mitigation area” established, *prior to a WRPR being issued.*

It is not reasonable for all sites—even sites where statistical evidence suggests that the HRL will be exceeded—to be classified in the “voluntary” ML1 and ML2 categories. More serious sites—where the HRL has been exceeded or is statistically likely to be exceeded or where a significant number of private wells already exceed the HRLs—must immediately be prioritized for WRPRs. Under Minn. Stat. § 103H.275, the commissioner is required to ensure that the water source protection requirements are “designed to prevent the pollution from exceeding the health risk limits.” As currently drafted, this rule fails to meet this standard.

1573.0040, subp. 1.⁵⁷ Although subpart 1 notes that the application of the part is “to responsible parties in drinking water supply management area,” it would be more accurate to state that this part establishes the procedures that the *commissioner* will use to establish and evaluate mitigation level areas prior to issuance of a water resource protection requirement order. MCEA proposes that requirements for responsible parties in designated mitigation areas prior to the issuance of a WRPR also be included in this section of the rule.

1573.0040, subp. 2. This states that the commissioner will use public well nitrate-nitrogen concentration data provided by the commissioner of health to designate a DWSMA with a “mitigation level.” While there is no problem with using data provided by the Department of

⁵⁷ As noted above, MCEA finds no support in the record for the commissioner’s decision to limit the designation of mitigation levels to DWSMAs, because the decision arbitrarily leaves persons depending on private wells—persons who are more vulnerable to health impacts from nitrate levels with fewer options for addressing the exceedance—without regulatory protection.

Health (and indeed, the MDA should defer to the Minnesota Department of Health), this rule subpart cannot be enforced because it does not provide a deadline for the commissioner to act on the data provided. To address this issue, the rule must provide an action deadline, i.e., 60 days from the date that the Department of Health provides the necessary data.

1573.0040, subp. 3. This section establishes the criteria for “being designated” by the commissioner at a particular “mitigation level.”

A ML2 is where, within a rolling 10-year period, (a) based on a “statistical analysis”⁵⁸ . . . the groundwater. . . is projected to exceed the health risk limit in the next ten years; or (b) a reading has been 8 mg/L or greater. It is unreasonable to classify an area as an ML2 if it is statistically likely to exceed the HRL, or has in fact documented an exceedance of an HRL. Immediate mandatory actions are needed for such sites, i.e., a WRPR, if the statutory goal of Minn. Stat. § 103H.175 to prevent exceedance of the health risk limit is to be achieved. Under the rule as currently proposed, a public well could have had a reading of 12 mg/L nitrate, but still have its associated DWSMA characterized as a “voluntary only” mitigation level 2. This approach is not supported by the record, and does not comply with the Minn. Stat. § 103H.275.

Having established these “voluntary only” mitigation levels, the rule provides that the commissioner can, nevertheless, exclude portions of the affected DWSMA from the ML area. Subpart 3, item B provides that the commissioner “may make exceptions for increasing a mitigation level” for a “nonmunicipal” public supply well based on “significant change” in land use, and “the severity of nitrate” in “other wells” and the “population affected” and “other factors.”⁵⁹ Item C provides that the commissioner “may exclude” an area if there is a point source “that is...significant” and item D provides that the commissioner “may exclude” a part of a DWSMA from the mitigation level if the commissioner determines that the area is not contributing “significantly” to the contamination. These exclusions are all purely subject to the discretion of the commissioner and fatally vague, and must be eliminated from the proposed rule or amended to remove the vague language and excessive discretion.

1573.0040, subp. 4. Subpart 4 requires the commissioner to “determine” the nitrogen fertilizer BMPs for the affected DWSMA, but this is unnecessary because the BMPs for various areas of the state are well-established.

1573.0040, subp. 5. In subpart 5, the commissioner is required to conduct some form of monitoring, but that monitoring may only be to obtain data from the public well. As the commissioner is already obtaining data from the public well, this part fails to define any new mandated monitoring activities and therefore fails to protect the public. To the extent that this provision was written because of limited resources for monitoring, MCEA proposes that the monitoring criteria include priorities for monitoring.

⁵⁸ The method should be described in the rule.

⁵⁹ This provision suffers from the same “substantive due process” defect as the decision to abandon private wells from protection under the rule: it provides lesser protection to smaller public well user groups based on the argument that MDA needs to prioritize work in other areas.

1573.0040, subp. 6. In subpart 6, the commissioner is required to conduct an evaluation of the ML2 to determine whether the BMPs have been implemented. There is no time limit on the commissioner to conclude this evaluation, but only a minimum time (3 years) that the commissioner must allow for evaluation. In general, voluntary implementation of BMPs has not protected the groundwater from nitrate contamination, and should not be continued under this rule. MCEA believes that BMP implementation is not a valid criterion on which to base continuous voluntary action, particularly when a significant percentage (20 percent) of responsible parties are not counted, the criteria for determining BMP compliance are not clearly stated, and the time and resources needed to accomplish this survey has not been justified. At any rate, it is manifestly unreasonable for the rule to allow evaluation of compliance for an unlimited period of time. The rule must establish a firm limit for the time that the commissioner can take to evaluate BMP compliance. Given the prolonged period of time that BMPs have been the subject of outreach to agricultural communities, this time should be short.

1573.0040, subp. 7. Subpart 7 is important, because it describes how the commissioner can redesignate a ML2 (where nothing is required) to a ML3 (where a WRPR can be issued).

Item A. This item suffers from the same defect as subpart 6: no limit is put on the time during which the commissioner will evaluate ML2 designation. The length of the allowed evaluation period is “no fewer than three growing seasons” or “the lag time”—whichever is longer.⁶⁰ This means that the commissioner could “evaluate” for an unlimited amount of time. If BMP compliance is maintained as part of this rule, it must be changed to provide a firm end-date for the evaluation period, such as 3 years. This period should be adequate for the commissioner to determine whether the BMPs have been implemented, and whether they are having an impact.

Item B. MCEA does not support item B, which allows a ML2 to become and ML1. Once the criteria for an ML2 have been met, the ML2 should not be redesignated as a lower-priority ML1, as that may allow the conditions under which the nitrate contamination developed to re-occur. MCEA supports adding mandated actions for responsible parties once a ML has been designated. For example, at a ML2, MCEA believes that responsible parties should conduct soil sampling. This soil testing requirement is reasonable because it has been implemented in Nebraska for many years, is not burdensome and is likely in use where a crop consultant is employed, and (where manure is used) can be combined with required testing under MPCA’s rules. It is reasonable for the responsible parties and the commissioner to collect this data to ensure that actions that are being taken are having a positive effect, and to be able to better determine where additional resources and actions may be necessary.⁶¹ The SONAR also notes that “Canadian researchers have used nationwide residual soil nitrate information from shallow sampling over time to make policy decision related to fertilizer use efficiencies and groundwater implications (Yang et al., 2007; Drur et al., 2007).” *Id.* The SONAR rejects the idea of requiring testing on the basis of unstated “cost” and because “this testing requires access to a large number of acres.”⁶²

⁶⁰ MCEA notes that the proposed rule also states that, “however,” if residual soil nitrate testing is conducted, the review period shall not be less than three growing seasons. As the word “however” seems to be wrong in this context because nothing is changed, MCEA wonders if MDA meant to propose that the review period would “not be *more* than three growing seasons.”

⁶¹ See SONAR pp. 122-4

⁶² *Id.*

However, if the producers are doing the testing themselves, no access is needed. The unstated cost cannot be unreasonable given that the requirement is one of longstanding in Nebraska. Other state rules require regular soil testing without compensation.⁶³ The BMPs recommend use of soil nitrate tests in a number of cases.⁶⁴ Testimony at the St. Cloud rulemaking hearing supports that producers are testing their soils voluntarily. Similarly, responsible parties in an ML3 area should prepare nutrient management plans in accordance with National Resources Conservation Service Practice Nutrient Management guidelines.⁶⁵

Items C-E. Items C-E establish criteria for moving a well from a ML2 to a ML3. MCEA does not support item C, which appears to allow the area to remain a ML2 so long as 80 percent of the responsible parties are in compliance with the BMPs, even if the statistical analysis still demonstrates that exceedance of the HRL is probable. Item D provides that the commissioner “shall” move to a ML3 if the net residual nitrate in soil below the root zone is increasing “after not less than 3 growing seasons.” MCEA cannot support this criterion, because there is no limit on the number of growing seasons that could be considered, but could support this criterion if the evaluation was required after 3 years. Item E provides that the commissioner “shall” move to a ML3 “if the statistical analysis indicates the nitrate-nitrogen concentration is increasing for the public well or groundwater monitoring network.” MCEA supports this criterion, provided this evaluation is not viewed as being limited by the time criterion stated in Item A.

Item G. This item allows the commissioner to “grant a onetime exemption” from the move to ML3 on the vague criteria that “responsible parties...have demonstrated progress.” Because there are no criteria for “demonstrating progress,” MCEA does not support granting the commissioner this authority.

Item H. MCEA does support item H, which allows the commissioner to “make exceptions for increasing a mitigation level designation if there has been a significant change in land use.” Because what is “significant” is not defined, this criterion is fatally vague and should be eliminated.

1573.0040, subp. 8. Subpart 8 suffers from many of the same defects as subpart 7, in particular the language allowing the commissioner an unlimited period in which to evaluate whether a ML3 should be redesignated as a ML4. MCEA refers the ALJ to its comments on subpart 7.

1573.0040, subp. 9. Subpart 9 describes how ML4 area can be redesignated as a ML 3 area, if the water will not exceed the HRL in 10 years based on statistical analysis, and no three samples have reached or exceeded 9.0 mg/L. As noted above, MCEA does not believe that it is appropriate for an area that has demonstrated the potential to exceed the HRL to “drop back” to a level of lessor protection that may allow the prior conditions to re-occur.

⁶³ See Minn. R. 7020.2225, Subp. 3, Item C (phosphorus).

⁶⁴ See, e.g., sugarbeet production.

⁶⁵ Available at

https://www.nrcs.usda.gov/wps/portal/nrcs/detail/mn/technical/ecoscience/nutrient/?cid=nrcsepr_d1369002 (last visited August 14, 2018).

1573.0040, subp. 10. MCEA does not support the artificial and unsupported limit stated in Subpart 10, which limits the move to one ML. If an area should suffer a sudden increase in nitrate levels, there is no reason for the rule to limit the authority of the commissioner not to take action as required by the Groundwater Protection Act.

D. WATER RESOURCE PROTECTION ORDER PROCESS (1573.0050):

Part 1573.0050 establishes the requirement for the commissioner to issue a WRPR, but does not provide adequate due process or standards for WRPR development.

1573.0050, subp. 1 requires the commissioner to issue a WRPR to responsible parties in ML3 and ML4 areas, but does not establish any deadline or any standard that must be met. As a result, there is no stated basis on which the order can be challenged or reviewed, except broadly as not meeting the requirements of the statute.

Item A. Item A notes that the commissioner will issue WRPRs based on the monitoring in part 1573.0040, subp. 5, but, as discussed above, this provision does not require the commissioner to do any monitoring as currently drafted.

Item B. Item B requires the WRPR to apply to the “entire” DWSMA—but only if a groundwater monitoring well network is installed or residual soil nitrate testing is conducted. As noted above, such testing is not mandated. As a result, the commissioner’s authority to issue a WRPR to the entire DWSMA is likely quite limited and will not achieve the statutory mandate of Minn. Stat. § 103H.275 to prevent exceedances of the health risk limit.

Item C. This item includes another unnecessary and complicating limitation on the scope of the WRPR that can be issued. If the commissioner has not installed a groundwater monitoring network,⁶⁶ subpart 1, item C, limits the scope of the WRPR based on estimated lag time and travel time.⁶⁷ Again, the WRPR will not necessarily apply even to the whole DWSMA established by the Commissioner of Health. MCEA objects to this unreasonable limitation on the commissioner’s authority.

Item D. This item prioritizes the issuance of WRPRs. It is reasonable for the commissioner to establish criteria for prioritization, but these criteria could be expanded.

Item E. Item D states what must be included in a WRPR, but isn’t specific other than including “the water resource protection requirements.”⁶⁸ For a meaningful order, there needs to be

⁶⁶ Although the commissioner is required by part 1573.0040, Subp. 5 to monitor a DWSMA, the commissioner is **not** required to install a groundwater monitoring network. Thus, it is impossible to predict how many DWSMAs will be fully subject to the WRPR, once issued.

⁶⁷ The process by which the commissioner will make the determination is vaguely described in part 1573.0050, Subp. 1, Item C. As a DWSMA is generally based on the 10-year travel time to the protected well, it is unclear why the commissioner here would choose a different area to protect, and this provision therefore introduces unnecessary complication into the process. See Minn. R. 4720.5510.

⁶⁸ These requirements are evidently intended to be the requirements in part 1573.0060, but those requirements are only to maintain and provide upon request the field-specific records documenting nitrogen fertilizer use, to comply with the already applicable fall application and

language (at a minimum) such as “the commissioner’s order must include water resource protection requirements that are necessary to ensure that pollution is minimized to the extent practicable and to prevent the pollution from exceeding the health risk limits.” Even better, MDA should establish that each WRPR must include basic items, such as mandated practices, monitoring, recordkeeping, and reporting requirements, to be adequate.

Item F. Item F is unnecessary and redundant with Item A.

Item G. Item G is vague and cannot be enforced because no standards are established under which the commissioner will determine than an “area is not contributing significantly to the contamination in the well or that it is not practicable to include that part.” As a result, it should simply be eliminated from the proposed rule.

1573.0050, subp. 2. This subpart addresses notice that will be given regarding the WRPR, but lacks properly articulated due process.

Item A. This item requires the commissioner to hold “at least one” public information meeting in the county affected by the proposed MRPR before it is published. Normally, a proposed permit, environmental review document, or other administrative action would first be published so that the public attending the meeting have an opportunity to review and raise questions that are meaningful. Subpart 2 should be amended to require the public informational meeting(s) to be held during the public comment period following publication of the proposed WRPR notice. The rules should specify how the commissioner will conduct the public informational meeting, particularly if the commissioner decides to use the public informational meeting as a forum for receipt of comments on the rule in lieu of or in addition to the right to request a contested case hearing under the Minnesota Administrative Procedures Act. The rule should provide that the commissioner must include a record of comments and responses to all substantive comments received during the public informational meeting when the final WRPR is issued as part of the findings on the WPRP.

Item B. This item deals with notice. It should be amended to specify that the commissioner must provide a copy of the proposed order, proposed findings, and a technical support document explaining its terms and conditions, to the “affected parties” who must include persons who are drinking the water that is threatened with nitrate contamination. This is reasonable because other agencies (i.e., the MPCA) typically provide fact sheets or technical support documents in support of their proposed actions.⁶⁹

1573.0050, subp. 3 addresses contested case hearings.

frozen soils prohibitions, and “comply with any water resource management requirements orders that apply to the drinking water supply management area governing the cropland over which the responsible party has control” which adds nothing and is circular in the extreme. In proposed part 1573.0070, the rule lists only content that the commissioner “shall consider.” Alternative management practices can only be mandated if they are “funded” meaning that a responsible party does not bear the cost of compliance.

⁶⁹ See, e.g., Minn. R. 7001.0100.

Item A. This item should be amended to provide that “any person or entity subject to the water resources protection requirements order *or affected by the water resource protection requirements order*” can petition for a contested case hearing. It is necessary to include affected persons (i.e., persons who depend on the water supply) to ensure that the persons who are supposed to be protected by the rule can exercise their rights if the commissioner’s order is deficient.

Item C. This item requires the commissioner to order a “public hearing” if one is requested. A “public hearing” is not the same as a “contested case hearing.” In the SONAR, MDA states that the process that it intends to follow was based on that used to create the “public waters inventory.” It is unlikely that MDA has correctly selected the necessary due process, because the public waters inventory did not create any new requirements on the owners of the listed waters. The public waters inventory simply created a record of which waters were or were not public waters based on existing statutory criteria, and did not impose new requirements.⁷⁰ Furthermore, the proposed rule does not, in fact, set forth or follow the procedures that were used to adopt the public waters inventory, which involved county review and approval and special hearing teams.⁷¹

MCEA recommends that the commissioner create a “two option” process for receiving comments and recommendations on the proposed WRPR. The first process would be informal: holding a public informational meeting where members of the public could testify before department representatives who would then have to draft a formal “response to comments” document as part of the WRPR findings. The second process would be formal: holding a contesting case hearing under chapter 14 rules if the criteria for requesting a formal hearing are met.⁷² Minn. Stat. § 14.57 provides that, unless otherwise provided by law, “an agency shall decide a contested case only in accordance with the contested case procedures of the Administrative Procedure Act.” As there is no other law establishing a separate procedure, MDA must order any “contested cases” as provided under Chapter 14.

1573.0050, subp. 5. This subpart appears to allow amendments to the WRPR just with notice and comment. MCEA does not object to this process, provided that the final amended order is subject to judicial review as a final agency order. MCEA proposes that the commissioner have the duty to review and amend issued WRPRs on a 5 year basis to ensure that the terms are having the desired impact on nitrogen levels.

1573.0050, subp. 6. This subpart allows “any person subject to a final . . . order or amended order to seek judicial review.” This provision suffers from the defect that it limits review only to those persons “subject to” orders, which (MCEA assumes) means that only the responsible person can appeal. Minn. Stat. § 103H.275 does not limit rights to persons “subject to” orders,

⁷⁰ See Minn. Laws 1979, ch. 199, § 7 (required DNR publication, county board review, DNR notice to counties of accepting or rejecting county recommendations, publication of final listings, process by which “any person” or county could challenge the designation of specific waters as public waters, publication of final listing).

⁷¹ *Id.*

⁷² MCEA recommends that MDA use the criteria employed by other state agencies for ordering contested case hearings. See, e.g., Minn. R. 7000.1900 (MPCA); Minn. Stat. § 93.483, subd. 3 (DNR mining permit).

but instead refers to “persons affected by the rule and order of the commissioner.”⁷³ The rule must be clarified to ensure that any affected party (i.e., party that can establish standing and who has participated in administrative proceedings) can appeal an order. The rule also fails to specify how a party can obtain judicial review. Is the judicial review provided under the Minnesota Administrative Procedures Act for a “contested case” (Minn. Stat. § 14.63), which provides that an appeal must be filed in 30 days, or would review be provided under the “generic” certiorari statute, Minn. Stat. ch. 606, which provides for 60 days in which to seek review? If MDA intends that review be under the Minnesota Administrative Procedures Act, then a hearing under that act must be offered.

1573.0050, subp. 7. This provision requires the commissioner to record all final WRPRs. MCEA respectfully suggests that MDA ascertain whether this is possible, and what the effect of a “blanket” recording would be.

**E. REQUIREMENTS FOR RESPONSIBLE PARTIES SUBJECT TO WRPRs
(1573.0060-90).**

In this part, the proposed rule establishes certain requirements for responsible parties subject to WRPRs, such as recordkeeping. Above, MCEA has proposed to include certain of these requirements (such as recordkeeping) when mitigation levels are established, and does not agree with limiting these requirements to parties that are subject to a WRPR. If MCEA’s proposal is accepted, this part is needed only to specify what records must be kept and for how long, and to provide conditions on access consistent with MDA’s statutory authority.

1573.0060. This provision requires a responsible party in a mitigation level 3 or 4 area to maintain field-specific records “starting with the effective date of the water resource protection requirements order.” As noted above, it is unreasonable to wait to require such record-keeping until a WRPR is issued as this is a low-impact requirement that producers should be using under the BMPs to monitor their nutrient use. Item A(3) requires compliance with the fall application prohibition, but this would already be required for these producers if the DWSMA protected well has had a reading over 5.4 mg/L, which would be the case for ML3 and 4 areas receiving a WRPR, so it adds nothing and could be confusing, causing persons subject to the “part 1” fall application ban to believe that nothing is required until a WRPR is issued.

1573.0070, subp. 1. This section requires the commissioner “to consider” including the listed requirements in a WRPR. As a result, the content of the order is not cabined in any way by this rule. Under these circumstances, only the due process related to the draft order will allow parties to challenge the content of the order, but this due process is deficient as noted above. MCEA supports making certain of these content requirements mandatory with any order, i.e., field testing, monitoring, crediting of all nutrient sources, nutrient management plans, and the use of alternative management tools that the commissioners specifically finds are necessary to reduce soil nitrogen-nitrate levels in the area subject to the WRPR.

⁷³ Minn. Stat. § 103H.275, subd. 2(d).

MCEA is deeply troubled by the limit posed by subpart 1, item B. Item B limits the commissioner's ability to impose alternative management tools by stating that such tools can only be mandated as part of an order "provided a source of funding for increased costs related to the implementation of the alternative management tool is available to responsible parties." This is arbitrary and will thwart achievement of the goals of the Groundwater Protection Act. Other parties required to protect public resources (for example, those who are regulated under air, water or solid waste permits issued by the MPCA) must internalize the cost of compliance, and are not allowed to avoid compliance unless government money pays for it. In other regulatory programs, if a regulated party finds that the cost of compliance is unreasonable, the regulated party has the burden of seeking relief.⁷⁴ The same process should be applied to agricultural producers, especially where there are numerous sources of public funds available to defray the cost of compliance.⁷⁵ Compliance should not be limited to funded activities unless the cost of compliance would present a hardship, and then only if reasonable conditions are established in a schedule of compliance to ensure that any damage caused by the delay is limited. The proposed rule does not require any showing of hardship, and therefore is unreasonable. The prohibition on requiring AMTs, the very practices that the MDA has acknowledged will be necessary to achieve the HRL in vulnerable areas, unless funding is provided, must be removed from the rule because it is contrary to the goals of the Groundwater Protection Act. If MDA wants to provide some limited time for a responsible party to obtain funding necessary to comply with the AMTs, a schedule of compliance process could be included in the part of the rule addressing WPRPs, limited to agreements with the commissioner lasting no longer than two years. This should be adequate to address temporary situations resulting from weather events and temporary financial situations affecting a particular responsible party.⁷⁶

1573.0070, subp. 2. This subpart addresses requirements for mitigation level 4. In the SONAR, the MDA states that in mitigation level 4, "alternative management practices that meet the requirements listed under Minn. Stat. § 103H.275, subd. 2(a) shall be considered for inclusion in a water resource protection requirements order regardless of whether or not funding is available" but this authority is not found in the rule. If ML4 area regulated parties can be mandated in a WRPR to use alternative management tools, it should be expressly stated. The cost of compliance should not be the deciding factor in determining whether a management practice should be imposed. Cost is but one factor that should be considered under the statute.⁷⁷ Item B in this section limits the commissioner's authority to require fertilizer application rates that are less than the recommended rate set by the University of Minnesota. Fertilizer application rates are set to ensure the maximum harvest level, not to protect groundwater. As the purpose of the WRPR is to protect groundwater, the commissioner must have the authority to require application rates

⁷⁴ See, e.g., Minn. R. 7000.7000.

⁷⁵ The various funding opportunities are listed on MDA's website and the website of the Board of Water and Soil Resources.

⁷⁶ For other parts of the rule, MCEA notes that state law already contains a variance process, which could be utilized by responsible parties. The proposed rule might be amended to include a reference to that process. See Minn. Stat. §§ 14.055-.056.

⁷⁷ Minn. Stat. § 103H.275, subd. 2.

that are less than recommended if the particular circumstances of the situation make such reduced rates reasonable.

1573.0070, subp. 2, item C. Subpart 2, item C, prohibits the commissioner from restricting the selection of the “primary crop.” The term “primary crop” is undefined. It is unclear whether this term means that the commissioner is prohibited from requiring, as an alternative management tool, the inclusion of a nitrogen-reducing crop in a rotation, and thus is fatally vague. To achieve the goal of the Act, the commissioner must have the authority to require, if circumstances demand, that extremely vulnerable acres not be planted with crops that contaminate drinking water supplies, or that a different crop be added into a crop rotation, such as alfalfa or grasses, that would quickly reduce soil nitrate levels.⁷⁸ To eliminate the commissioner’s authority to require a technique that is well-established as a method to reduce soil nitrogen-nitrate levels is arbitrary.

1573.0070, subp. 3. Subpart 3 provides the commissioner, with unlimited discretion, the authority to provide exemptions to a WRPR “on a site-specific basis.” There is no description whatsoever of how this process would be made public or controlled. As a result, this provision is fatally vague. Instead, the commissioner should establish a fair temporary schedule of compliance process whereby particular conditions that create hardship, on a site-specific basis, can be fairly evaluated and addressed in a controlled fashion.

1573.0080. This rule provides that a responsible party who is certified through the Minnesota Agricultural Water Quality Certification Program (“MAWQCP”) is “deemed to be in compliance” with this chapter. MDA’s rule proposal requires the Department to presume that land certified under the MAWQCP is cropland where the nitrogen fertilizer use recommendations have been fully implemented. However, the MAWQCP does not require certified farms to either meet these recommendations, or implement any other practices that reduce nitrate contamination in groundwater.⁷⁹ Unless MDA provides evidence that a certified farm has implemented the nitrogen fertilizer use recommendations, this presumption is not justified.

1573.0090, subp. 1. This subpart requires the commissioner to maintain a list of alternative management tools (“AMT”) on the MDA website, and to note if the tool can be substituted for a nitrogen fertilizer best management practice. No standard is provided for when this substitution is to be authorized, making this rule fatally vague. The commissioner should, *in this rule*, list the alternative management tools and which AMTs can be substituted for specific BMPs or amend the rule to provide a more functional definition of AMT.

⁷⁸ See De Haan et al, *Residual soil nitrate content and profitability of five cropping systems in northwest Iowa*, PLOS One, March 1, 2017; 12(3); e0171994, available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5332022/>. See also Comment of Dr. Gyles Randall, August 1, 2018.

⁷⁹ See *Minnesota Agricultural Certainty Program: Is It Working for Water Quality, An Assessment of Minnesota’s Agricultural Water Quality Certification Program*, MCEA, December 2015.

Item C. Item C allows a responsible party subject to a WRPR to implement an AMT if the commissioner's list allows it, subject only to keeping records of all AMTs used "and the specific water resource protection requirements order that allows the alternative management tool to be used." This is reasonable if the only time an AMT is allowed to substitute for a BMP is under the control of a WRPR, but the rule is not clear.

1573.0090, subp. 2. This subpart allows a person who is subject to a WRPR to apply to the commissioner for an alternative protection requirement pursuant to statute. However, the rule fails to establish any due process concerning how such a substitution will be approved, and is therefore deficient. MCEA suggests requiring such alternative protection requirements to be proposed during the comment period on the WRPR.

IV. CONCLUSION

MCEA supports the need for a rule to prevent and mitigate nitrate pollution in groundwater. The instant rule falls short of what is needed and what Minn. Stat. § 103H.275 demands, in particular because it offers little protection to persons who get their drinking water from private wells, and because it continues to lean on BMPs to reduce nitrate levels despite the fact that BMPs have not succeeded in reducing nitrate levels to date. In order to be approved, the rule must be amended to eliminate vague and unenforceable language and the rule must ensure that groundwater is protected and that the HRL is not exceeded. Finally, where the rule is to be used as the basis for issuance of an order, it must include adequate standards and procedures to ensure that all affected parties have an opportunity to seek meaningful relief, and should not prevent the commissioner from requiring reasonable agricultural practices that reduce soil nitrate/nitrogen levels.

Sincerely,

/s/Ann Cohen

Ann Cohen

Staff Attorney

Minnesota Center for Environmental Advocacy

Exhibit B

**Clean Water Organizations’
Comments on the Proposed 2021 NPDES General Permit
for Concentrated Animal Feeding Operations**

July 23, 2020

INTRODUCTION

Nitrate pollution from manure and commercial fertilizer is a serious problem in Minnesota. Despite laws intended to limit manure application, nitrate pollution from excess manure continues to contaminate drinking water and degrade aquatic habitats. Minnesota Center for Environmental Advocacy,¹ Friends of the Mississippi River,² Minnesota Well Owners Organization,³ and Sierra Club North Star Chapter⁴ (collectively, “Clean Water Organizations”) have concluded that the

¹ Minnesota Center for Environmental Advocacy (“MCEA”) is a Minnesota non-profit organization that defends every aspect of Minnesota’s environment, relying upon facts, science, and the law. For nearly half a century, MCEA has worked with community members, decision makers, and other partners to protect Minnesota’s natural resources and the health and wellbeing of all the state’s citizens. As a public interest organization, MCEA works to ensure that Minnesota’s bedrock environmental laws are enforced and defended. It has a particular interest in water quality, and it has engaged in legislative and administrative advocacy, rulemaking and permitting proceedings, and litigation to protect Minnesota’s water quality.

² Friends of the Mississippi River (“FMR”) is a nonprofit established in 1993 to engage Minnesotans to protect, restore, and enhance the Mississippi River and its watershed in the Twin Cities Metro area. As part of its efforts to protect and preserve a clean Mississippi River, FMR works with 2,500 members, 2,000 advocates, and over 5,000 volunteers yearly. A major part of FMR’s work is focused on watershed protection for the Mississippi River, including preserving water quality by advocating for land use policies and practices that will lead to cleaner water throughout the entire watershed.

³ Minnesota Well Owners Organization (“MNWOO”) is a nonprofit organization for private well owners that works to preserve, protect, and restore Minnesota’s water resources and to ensure the safety of those who use private wells for drinking water. MNWOO also provides education, technical and legal services, and advocacy for private well owners. MNWOO works to protect the water quality of the 1.2 million private wells in Minnesota, more than 10% of which are contaminated at levels above allowed health risk limits. This includes many private wells with elevated levels of nitrates.

⁴ The Sierra Club North Star Chapter (“SCNS”) is a nonprofit organization that is the Minnesota branch of the national Sierra Club, America’s oldest, largest, and most influential grassroots environmental organization. SCNS works through grassroots political action, including its 80,000 members, to strategically address Minnesotans’ most pressing environmental issues. One of SCNS’s priorities in its water program is fighting agricultural pollution in Minnesota, including nitrate pollution.

newly proposed National Pollutant Discharge Elimination System (“NPDES”) General Permit for Concentrated Animal Feeding Operations (“Proposed General Permit”) drafted by the Minnesota Pollution Control Agency (“MPCA”) does not effectively address this problem or follow Minnesota’s laws regarding land application of manure. Unless MPCA revises the Proposed General Permit to better reflect the protective standards of the law, Minnesota’s water quality is likely to worsen during the permit’s tenure.

Since the MPCA issued the 2016 NPDES General Permit for Concentrated Animal Feeding Operations (“2016 General Permit”), Minnesota’s nitrate pollution problem has intensified. The drinking water for nearly half a million Minnesotans is now tainted with elevated levels of nitrates, which can cause cancers and other diseases. Now, MPCA has an opportunity to provide better protections for Minnesota’s waters, while ensuring farmers can meet their crops’ nitrogen needs, through the Proposed General Permit. Yet, the Proposed General Permit perpetuates the same problems that exist in the 2016 General Permit, which will lead to continued contamination of water needed for drinking, recreation, wildlife, and aquatic habitat. Accordingly, the Clean Water Organizations suggest changes to the Proposed General Permit to ensure the protection of water quality and compliance with Minnesota laws regarding manure application.

Most importantly, the Clean Water Organizations propose that the MPCA revise the Proposed General Permit to limit manure application rates to truly reflect expected crop nitrogen needs. As it did in the 2016 General Permit, the MPCA has referenced recommendations for manure application based on maximizing the economic return for farmers, not on the actual plant needs for nitrogen. These recommendations are inconsistent with the governing rules for land application of manure and have led to over-application by many farmers. MPCA must amend the Proposed General Permit to ensure that the referenced recommendations are consistent with the

rule's requirements. In addition, the Clean Water Organizations request that the MPCA revise Proposed General Permit to restore the section from the 2016 General Permit regarding pre-plant testing for nitrates, provide clearer requirements to farmers about determining soil temperatures prior to manure application, strengthen October restrictions on manure application, prohibit application of solid manure in December and January, and require geographic-information-system ("GIS") identification of fields in manure management plans. The Clean Water Organizations ask that MPCA revise the permit to make these changes or grant a contested case hearing so that material issues of fact can be heard by a neutral administrative law judge who can develop the record and present a recommendation to the MPCA.

I. MINNESOTA'S DRINKING WATER AND AQUATIC HABITATS ARE ALREADY POLLUTED WITH DANGEROUS LEVELS OF NITRATES

Minnesota takes great pride in its water. Minnesotans depend on their lakes, rivers, and groundwater as sources of clean, drinkable water and habitats for wildlife. While the "Land of 10,000 Lakes" claims the headwaters of the Mississippi River and other historical, cultural, and economically significant waterways, increasing levels of nitrates, which have profound impacts on aquatic and human life, are threatening the health of many of Minnesota's great waters.

A. Minnesota's Nitrate Pollution Is Worsening.

Nitrate contamination in Minnesota's drinking water systems is getting worse. Data collected by the U.S. Environmental Protection Agency ("EPA") showed that between 1995 and 2018, 63% of Minnesota's 115 community wells experienced growing nitrate contamination, with the southern part of the state experiencing the largest increases.⁵ As one example, in the Rock County Rural Water System, located in southwestern corner of the state, 24 of the 107 tests

⁵ Env'tl. Working Grp., *Nitrate Trends in Minnesota Drinking Water*, <https://www.ewg.org/interactive-maps/2020-in-minnesotas-farm-country-nitrate-pollution-of-drinking-water-getting-worse/map/> (last visited July 17, 2020).

collected during this time frame revealed nitrate levels exceeding 10 milligrams per liter (“mg/l”), the “safe for consumption” threshold set by the EPA in 1962.⁶ Across the state in Winona County, nitrates in the Utica water system surged between 2016 and 2018.⁷ Nitrates also threaten metropolitan area community water supplies. EPA tests collected from the Kjellberg system in Wright County, which serves approximately 1,000 people, revealed nitrate levels greater than 3 m/l in more than half of the 204 tests obtained during the study period.⁸ In Hastings, 217 out of 313 tests of its groundwater supply, which serves over 22,000 Minnesotans, showed nitrate concentrations exceeding 5 mg/l.⁹

The Minnesota Department of Health’s (“MDH”) testing also shows troubling trends for private wells. Prior to 2011, less than 1% of MDH private well tests showed nitrate contamination exceeding 10 mg/l.¹⁰ However, with the exception of 2016, beginning in 2011 and every year thereafter, more than 1% of tested private wells were contaminated with nitrate levels exceeding the federal safe consumption limit.¹¹

MPCA data confirms that nitrate levels in Minnesota’s surface waters are also increasing. Data collected between 1976 and 2010 reveal that 22 of Minnesota’s 32 major rivers shows a statistically significant upward trend in overall nitrate concentrations.¹² These rivers showed increases in nitrate concentrations as much as an astonishing 268% during the 30 to 35 year study

⁶ *Id.*

⁷ *Id.*

⁸ *Id.*

⁹ *Id.*

¹⁰ Minn. Dep’t of Health, *Nitrate in Private Wells*, https://data.web.health.state.mn.us/nitrate_wells (last visited July 17, 2020), attached as Ex. 3.

¹¹ *Id.*

¹² Minn. Pollution Control Agency, *Nitrogen in Minnesota Surface Waters* 150 (2013), available at <https://www.pca.state.mn.us/sites/default/files/wq-s6-26a.pdf>, [hereinafter “Nitrogen in Surface Waters”].

period.¹³ Most of MPCA’s regularly monitored testing sites along the Mississippi River have recorded an explosive growth of nitrate concentrations, with MPCA noting that, except for two specific sites, “nitrate concentrations [in the Mississippi River] have been increasing everywhere downstream of Clearwater at a rate of 1% to 4% per year” in recent years.¹⁴ MPCA monitoring sites on the St. Croix River reflected a 49% growth in nitrate concentration between 1976 and 2004.¹⁵ MPCA data collected from major tributaries similarly shows nitrate concentrations increased in the majority of sampled waterways during the study period, with the greatest recorded growth reaching 207%.¹⁶ And the contaminated Rock County Rural Water System discussed above is a surface water source of drinking water.¹⁷

B. Nitrate Pollution Poses Dangers For People And Aquatic Life.

This increase in nitrate pollution is a serious problem for Minnesotans, as elevated nitrate levels are hazardous to human health and wreak havoc on aquatic life. Increasing nitrate contamination threatens the health of the nearly 75% of Minnesotans who rely on groundwater for their drinking water.¹⁸ Consuming water contaminated with nitrates is associated with adverse birth outcomes, thyroid disease, neural tube defects, and several cancers.¹⁹ Elevated nitrate levels in drinking water are especially dangerous for infants, pregnant women, and people with certain

¹³ *Id.* at 151.

¹⁴ *Id.* at 398.

¹⁵ *Id.* at 177.

¹⁶ *Id.* at 150-51, 53.

¹⁷ Env’tl. Working Grp., *supra* note 2.

¹⁸ Minn. Dep’t of Agric., *Minnesota Nitrogen Fertilizer Management Plan 20* (2019), available at https://www.mda.state.mn.us/sites/default/files/2019-08/nfmp2015addendedada_0.pdf, attached as Ex. 4.

¹⁹ Alexis Temkin et al., *Exposure-Based Assessment and Economic Valuation of Adverse Birth Outcomes and Cancer Risk Due to Nitrate in United States Drinking Water*, 176 ENVIRONMENTAL RESEARCH 1-2 (2019), available at <https://www.sciencedirect.com/science/article/pii/S001393511930218X>, attached as Ex. 5.

blood disorders, who are at risk of methemoglobinemia, or “blue-baby syndrome,” which causes severe oxygen deficiency that, without medical treatment, can lead to death.²⁰

The EPA set the current health standard for nitrate in water at 10 mg/l in 1962 largely to protect against blue-baby syndrome. New studies strongly suggest that the current standard does not reflect the present understanding of nitrate associated health risks.²¹ According to a recent study by Environmental Working Group (“EWG”), lower levels, even below 5 mg/l, are associated with higher risks of certain cancers and adverse birth outcomes.²² EWG concluded that nitrate pollution of drinking water at levels far below the legal limit may cause up to 12,594 cases of cancer each year in the United States.²³ This tracks large-scale studies in Spain and Italy, published in 2016, and Denmark, published in 2018, which found statistically significant increases of colorectal cancer risks associated with nitrate levels below 2 mg/l.²⁴ Minnesota regulators should be exceedingly concerned by these new studies because hundreds of thousands of Minnesotans currently access public water systems contaminated with nitrates exceeding 3 mg/l.²⁵ Even worse, the data shows that over 150,000 Minnesotans accessed public water systems with nitrate contamination levels exceeding Minnesota’s health standard of 10 mg/l.²⁶ Nitrates also plague private water supplies. Minnesota Department of Agriculture data collected pursuant to its Nitrate Clinic Outreach Program shows that 7.7% of 2,063 private well tests reported nitrate levels

²⁰ Minn. Dep’t of Agric., *supra* note 15, at 7-8.

²¹ Minn. Dep’t of Health, *Nitrate in Well Water*, <https://www.health.state.mn.us/communities/environment/water/wells/waterquality/nitrate.html#:~:text=Safe%20Level,water%20for%20public%20water%20supplies> (last visited July 17, 2020), attached as Ex. 6; Sarah Porter & Anne Weir Schechinger, Env’tl. Working Grp., *Tap Water for 500,000 Minnesotans Contaminated with Elevated Levels of Nitrate* (Jan. 14, 2020), attached as Ex. 7.

²² Temkin et al., *supra* note 16, at 11; Porter & Schechinger, *supra* note 18.

²³ Porter & Schechinger, *supra* note 18.

²⁴ *Id.*

²⁵ Minn. Dep’t of Health, *supra* note 18.

²⁶ Porter & Schechinger, *supra* note 18.

exceeding 10 mg/l.²⁷ The 2012 data shows an increase in the percentage of private wells exceeding the current standard from samples tested in 2011, suggesting nitrate infiltration into well water supplies throughout Minnesota is an increasing problem.²⁸ In fact, due to a lack of testing, the number of contaminated wells in Minnesota may actually be much greater.²⁹

In addition to impairing drinking water, elevated nitrate concentrations in Minnesota's waterways are significant contributors to aquatic habitat destruction. High nitrate levels in surface waters directly contribute to eutrophication, which stimulates excessive plant growth and depletes oxygen levels in the water, causing harm or death to fish.³⁰ Nitrate also is directly toxic to fish and other aquatic organisms, causing heart and liver problems, electrolyte imbalance, and increased vulnerability to bacterial and parasitic diseases.³¹ Due to nitrate's solubility in water, its ultimate intrusion into the Mississippi River is in part to blame for the hypoxic "dead zone" in the Gulf of Mexico.³² One study estimates that the 158 million pounds of nitrate that leave Minnesota annually via the Mississippi River has caused nearly \$2.4 billion in annual damages to fish stocks and habitat for more than 30 years.³³

C. Much Of Minnesota's Nitrate Problem Is Caused By Agriculture.

Agriculture is Minnesota's largest contributor to nitrate pollution—specifically, nitrate runoff or leaching from farmland from commercial nitrogen fertilizer or manure. According to the

²⁷ Minn. Dep't of Agric., *2012 Nitrate Clinic Outreach Summary Report 2* (2012), available at <https://www.mda.state.mn.us/sites/default/files/inline-files/2012nitrateclinic.ashx.pdf>.

²⁸ *Id.*

²⁹ Jennifer Bjorhus, *One in Eight Minnesotans Drink Nitrate-Tainted Tap Water, Report Says*, STAR TRIBUNE (Jan. 14, 2020), available at <https://www.startribune.com/one-in-eight-minnesotans-drink-nitrate-tainted-water/566960262/>.

³⁰ Nitrogen in Surface Waters, *supra* note 9, at 43.

³¹ *Id.*

³² *Id.* at 36, 46.

³³ Rebecca Boehm, Union of Concerned Scientists, *Reviving the Dead Zone 3* (2020), available at <https://www.ucsusa.org/sites/default/files/2020-06/reviving-the-dead-zone.pdf>.

Minnesota Department of Agriculture, approximately 2.7 million tons of inorganic nitrogen are added to Minnesota soils each year, and 80% of that nitrogen is attributable to agriculture.³⁴ Unfortunately, a significant portion of that nitrogen reaches state waters. In its 2013 study, MPCA estimated that cropland sources account for almost 73% of the statewide nitrate load to streams and lakes in an average year.³⁵ A “significant” part of this comes from applied manure.³⁶ Notably, MPCA found that the largest increases in nitrate pollution are clustered in the southern third of the state, where most of Minnesota’s confined animal feeding operations are located.³⁷

This is unsurprising. Domestic and international studies have long confirmed an association between livestock concentration and a documented degradation in water quality. For example, Iowa watersheds with the highest livestock density had some of the highest stream concentrations of nitrates in the state.³⁸ In the Chesapeake Bay watershed, for example, land application of manure contributes to elevated ground water nitrate concentrations and suffocating algae blooms.³⁹ This connection is not new. In the 1960s, nutrient runoff from the Danube River seriously degraded the northwestern Black Sea.⁴⁰ Conditions rapidly improved after the fall of communist regimes in the late 1980s precipitated the closure of many large animal farms.⁴¹

The ease with which nitrate escapes the fields is largely to blame. A significant amount of nitrogen from applied manure is lost through volatilization, runoff, and leaching. The University of Minnesota Extension Service (“Extension Service”) estimates that up to 50% of the nitrogen

³⁴ Minn. Dep’t of Agric., *supra* note 15, at 33-34.

³⁵ Nitrogen in Surface Waters, *supra* note 9, at 205.

³⁶ *Id.* at 219.

³⁷ *Id.* at 295; Minn. Pollution Control Agency, https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_pca/env_feedlots/preview/preview.jpg (last visited July 17, 2020).

³⁸ Dr. Christopher Jones, *Expert Report 6* (2020), attached as Ex. 1.

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

from manure may be lost through these processes.⁴² University of Minnesota research indicates that applications of nitrate above the economically optimum nitrogen rate for a specific crop significantly increase the potential for nitrate losses.⁴³

Partly to blame for the nitrogen losses is the way manure is applied by farmers and how it is used by plants. Manure contains both organic and inorganic forms of nitrogen.⁴⁴ While inorganic nitrogen—in the form of nitrate or ammonium—is available to be used by plants for growth immediately, the organic form is not.⁴⁵ Before plants can take up organic nitrogen, it must first be mineralized by microorganisms in the soil to inorganic forms.⁴⁶ After this conversion process, however, the inorganic form ammonium can be easily converted into gas and lost into the atmosphere through volatilization, only to cause water pollution when it dissolves in rain and returns to earth.⁴⁷ But more significantly, since inorganic nitrates are soluble, they are prone to leaching.⁴⁸ Thus, the converted nitrate is highly susceptible to filtering through the soil profile and into the groundwater.⁴⁹

⁴² Univ. of Minn. Extension, *Manure Application Methods and Nitrogen Losses*, (2018), <https://extension.umn.edu/manure-land-application/manure-application-methods-and-nitrogen-losses>, [hereinafter “Manure Application Methods”], attached as Ex. 8.

⁴³ Melissa Wilson, Univ. of Minn. Extension, *Guidelines for Manure Application Rates*, <https://extension.umn.edu/manure-land-application/manure-application-rates> (last visited July 17, 2020), [hereinafter “Guidelines for Manure Application”], attached as Ex. 9.

⁴⁴ Melissa Wilson, Univ. of Minn. Extension, *Manure Characteristics*, <https://extension.umn.edu/manure-land-application/manure-characteristics> (last visited July 17, 2020), [hereinafter “Manure Characteristics”], attached as Ex. 10.

⁴⁵ *Id.*; Manure Application Methods, *supra* note 39.

⁴⁶ Manure Characteristics, *supra* note 41; Ron Wiederholt, N.D. State Univ. Extension Serv., *Environmental Implications of Excess Fertilizer and Manure on Water Quality* (2017) <https://www.ag.ndsu.edu/publications/environment-natural-resources/environmental-implications-of-excess-fertilizer-and-manure-on-water-quality>, attached as Ex. 11.

⁴⁷ *Id.*

⁴⁸ Scott C. Killpack & Daryl Bucholz, Univ. of Mo. Extension, *Nitrogen in the Environment: Leaching*, <https://extension2.missouri.edu/wq262> (last visited July 17, 2020).

⁴⁹ Wiederholt, *supra* note 43.

In addition, if a farmer applies manure incorrectly—in too large of quantities, on vulnerable soils, or at improper times—leaching or runoff is more likely. If too much manure is applied, plants do not take it up, allowing nitrates to leach away.⁵⁰ If manure is applied to coarse-textured soils, nitrates can sink past plant roots and into groundwater.⁵¹ If manure is applied early in the fall on ground that is too warm, it will quickly convert to into nitrate and likely be lost before spring planting; but if manure is applied in the winter on frozen soils, it is unlikely to be incorporated into the soil and instead runs off during melts or spring rains.⁵²

In addition, multiple factors make manure challenging to manage as fertilizer and encourage over-application. First, the nutrient concentration in manure is far lower and much more uncertain than commercial fertilizer.⁵³ Time windows for effective manure application are narrower than with commercial fertilizer, and farm implements designed to distribute manure to fields can apply material non-uniformly.⁵⁴ Nitrogen loss to the atmosphere through volatilization can be significant and difficult to predict.⁵⁵ And insufficient storage capacity for manure may lead to farmers applying manure at ineffective times, when it is more likely that nutrients will run off or leach into the water and be lost to plants.⁵⁶ These uncertainties may lead farmers to over-apply manure in their eagerness to ensure that plants have abundant sources of nitrogen to use as they grow—or may even cause them to apply manure in the fall followed by commercial fertilizer in

⁵⁰ Guidelines for Manure Application, *supra* note 43.

⁵¹ *Id.*

⁵² Melissa Wilson, Univ. of Minn. Extension, *Manure Timing*, <https://extension.umn.edu/manure-land-application/manure-timing> (last visited July 17, 2020), [hereinafter “Manure Timing”], attached as Exhibit 12.

⁵³ Jones, *supra* note 35, at 6.

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ *Id.*

the spring.⁵⁷ These factors “frequently result in manured land receiving larger amounts of nutrient than those that receive only commercial N [fertilizer].”⁵⁸

This is not necessarily a problem for the farmer, however. Unlike commercial fertilizer, which must be purchased, farmers with large livestock operations have access to free, always available manure in ample quantities. In some scenarios, research has found maximizing nitrogen loss to the environment is more profitable than attempting to use all of the nutrients from the manure.⁵⁹ For these farmers, manure is a waste product, and squandering its nutrients is not necessarily economically wasteful.⁶⁰ In fact, because of the costs of hauling manure, farmers may find it more profitable to concentrate manure applications on the fields closest to the animal confinements and buy commercial fertilizer—with its higher, uniform, and known nitrogen content—for the remaining fields.⁶¹

Overall, for farmers, the economic risk of under-applying manure is far greater than that of over-applying.⁶² When a farmer under-applies nitrogen, the farmer takes on a considerable economic risk: that crop growth will not be maximized, leading to lower yields and less product to sell.⁶³ But when a farmer over-applies nitrogen, the farmer is only taking on the risk of the cost of the additional manure—which in many cases costs nothing at all—while increasing the opportunity to maximize crop yields and product for sale.⁶⁴ While the economic risk to the *farmer* of over-application is small, however, the *environmental* risk of over-application is severe.⁶⁵ Any

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ *Id.* at 6.

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² *Id.* at 8.

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ *Id.*

excess nitrate not taken up by crops is vulnerable to loss to the atmosphere, aquifers, lakes, and streams.⁶⁶ This increases the costs to the public, which takes on the burden of addressing pollution, but does not increase costs to the farmer.⁶⁷ Accordingly, over-application of nitrogen “transfers the economic and natural risks associated with nitrogen application from the individual farmer to the public.”⁶⁸

Preventing nitrate from reaching water is vital to successfully addressing the growing nitrate pollution problem. Prevention is far less costly than treatment of contaminated water—when treatment is even possible.⁶⁹ Accordingly, controlling manure application to prevent nitrate runoff and leaching is critical to protecting public health from still worse increases in nitrate pollution. MPCA must ensure that the Proposed General Permit imposes restrictions that will adequately limit nitrate pollution to protect the people and aquatic habitats of Minnesota.

II. MINNESOTA LAW PLACES LIMITS ON LAND APPLICATION OF MANURE

Because of the harm posed by the threat of nitrate pollution, and the economic incentive of farmers to over-apply nitrogen, MPCA adopted a rule—Minn. R. 7020.2225, subp. 3 (“Land Application Rule”)—that imposes limits on the amount of manure that can be applied to fields as fertilizer. The Proposed General Permit must include those limitations.⁷⁰

The Land Application Rule requires that manure application be “limited” so that “the estimated plant available nitrogen from all nitrogen sources does not exceed *expected crop nitrogen needs* for nonlegume crops and *expected nitrogen removal* for legumes.”⁷¹ In other words,

⁶⁶ *Id.* at 2.

⁶⁷ *Id.* at 8.

⁶⁸ *Id.*

⁶⁹ Minn. Dep’t of Agric., *supra* note 15, at 18, 68.

⁷⁰ Minn. R. 7001.1080, subp. 1 (stating that any NPDES permit issued by the MPCA must “contain conditions necessary for the permittee to achieve compliance with all Minnesota or federal statutes or rules”).

⁷¹ Minn. R. 7020.2225, subp. 3(A) (emphasis added).

farmers must determine how much nitrogen their crops are expected to need or remove from the soil, how much nitrogen is available to their crops from all sources, and how much manure is needed to make up the difference between the needed nitrogen and available nitrogen. Then farmers must limit their manure application to ensure the application does not provide more nitrogen than the crops “need” or “remove.”

To perform this calculation, farmers must first determine “expected crop nitrogen needs,” “crop nitrogen removal rates,” and “estimated plant available nitrogen.” According to the rule, these variables “must be based on the most recent published recommendations of the University of Minnesota Extension Service or of another land grant college in a contiguous state.”⁷² Farmers must also identify all sources of nitrogen available to their crops, including “commercial fertilizer nitrogen, soil organic matter, irrigation water, legumes grown during previous years, biosolids, process wastewater, and manure applied for the current year and previous years.”⁷³

The rule provides some flexibility for farmers, however. Once the manure application calculation has been performed, farmers may deviate up to 20% from the Extension Service recommendations “where site nutrient management history, soil conditions, or cool weather warrant additional nitrogen application.”⁷⁴ And if crop nitrogen deficiencies are “visible” or “measured,” farmers may be able to apply even more nitrogen than the extra 20%.⁷⁵

III. THE PROPOSED GENERAL PERMIT SHOULD BE REVISED TO PROTECT WATER QUALITY AND COMPLY WITH MINNESOTA RULES

While the Proposed General Permit includes some positive changes, the draft does not go far enough to protect Minnesota’s water quality or comply with the Land Application Rule. Unless

⁷² *Id.*, subp. 3(A)(1).

⁷³ *Id.*, subp. 3(A)(3).

⁷⁴ *Id.*, subp. 3(A)(2).

⁷⁵ *Id.*

MPCA makes changes, nitrate pollution in Minnesota is likely to worsen during the five-year tenure of the Proposed General Permit. Accordingly, the Clean Water Organizations request MPCA make the following changes to the Proposed General Permit.

A. Section 13.3: Limitation Of Manure Application Rates

First, MPCA must revise the Proposed General Permit to limit rates of manure application so that application is truly restricted to the amount of nitrogen the crop needs, as required by the Land Application Rule. As written, the Proposed General Permit references recommendations from the Extension Service and the MPCA for plant nitrogen needs that are based on economic risk and cost factors that are unrelated to the amount of nitrogen a typical crop will actually need or remove. This is called the Maximum Return to Nitrogen, or MRTN, system. Based on analysis by experts Dr. Gyles Randall, professor emeritus at the University of Minnesota's Department of Soil, Water, and Climate, who has conducted numerous studies relating to plant nitrogen needs and removal; and Dr. Christopher Jones, research engineer at Iowa State University, the MPCA's referenced recommendations are not consistent with the standard established by the Land Application Rule.

1. MRTN is not a measure of expected crop nitrogen needs or expected nitrogen removal.

Under the Land Application Rule, farmers must "limit[]" manure application so that the plant available nitrogen in the soil from all nitrogen sources is no more than "expected crop nitrogen needs" for nonlegumes and "expected nitrogen removal" for legumes.⁷⁶ The Land Application Rule states that the "expected crop nitrogen needs" and "expected nitrogen removal" must be based on the most recent published recommendations from the Extension Service (or of

⁷⁶ *Id.*, subp. 3(A).

another land grant college in a contiguous state).⁷⁷ The Proposed General Permit, accordingly, identifies recommendations from the Extension Service and specifically two fact sheets from MPCA to use in determining “expected crop nitrogen needs” and “expected nitrogen removal.”⁷⁸ These fact sheets direct users to an Extension Service website, entitled “Calculating Manure Application Rates,” which directs users to first “find the nutrient needs of the crop.”⁷⁹ To do so, users are directed to another Extension Service website, called “Guidelines for Manure Application Rates.” This website provides recommendations based on the MRTN system, for example, 195 pounds of nitrogen per acre for corn following corn and 150 pounds of nitrogen per acre for corn following soybeans.⁸⁰

The MRTN referred to in these documents is based on three variables: expected crop price, expected nitrogen source cost, and expected crop production in response to the amount of fertilizer

⁷⁷ *Id.*, subp. (3)(A)(1).

⁷⁸ Minn. Pollution Control Agency, Proposed General Permit § 13.3 (2020) [hereinafter “Proposed General Permit”] (directing permit holders to “the most recent recommendations of the Extension Service and the MPCA fact sheets ‘*Manure Nitrogen Rates For Corn Production (wq-f8-18)*’ and ‘*Manure Management For Corn On Irrigated Sandy Soils (wq-f8-52)*’” (emphasis added)); see also Minn. Pollution Control Agency, *Manure Nitrogen Rates for Corn Production (wq-f8-18)* (2019) [hereinafter “Manure Nitrogen Rates for Corn”], attached as Ex. 13; Minn. Pollution Control Agency, *Manure Management For Corn On Irrigated Sandy Soils (wq-f8-52)* (2016), attached as Ex. 14.

⁷⁹ Melissa Wilson, Univ. of Minn. Extension, *Calculating Manure Application Rates* (2019), <https://extension.umn.edu/manure-land-application/calculating-manure-application-rates>, attached as Ex. 15.

⁸⁰ Guidelines for Manure Application, *supra* note 40. Concerningly, the MRTN recommendations under the current Extension Service documents are much higher than under previous versions of the recommendations. For example, the 2011 recommendations from Extension Service identify the MRTN at the 0.05 ratio as 155 lb. N/acre for corn after corn, and 120 lb. N/acre for corn after soybeans (and are even lower for less productive soils). It is unclear to MCEA why the recommendations have risen by 25% in both cases: 40 lb. N/acre for corn after corn and 30 lb. N/acre for corn after soybeans. This is a substantial and unexplained change that is almost certain to have significant environmental effects. See Univ. of Minn. Extension, *Fertilizer Guidelines for Agronomic Crops in Minnesota* 15 (2011), available at <https://conservancy.umn.edu/bitstream/handle/11299/198924/Fertilizer%20Guidelines%20for%20Agronomic%20Crops%20in%20Minnesota.pdf?sequence=1&isAllowed=y>.

applied.⁸¹ While the expected crop production is based on research into plant nitrogen needs, the other variables can significantly change the recommended amount of nitrogen farmers should apply.⁸² Accordingly, recommendations based on the MRTN system are intended to maximize economic performance for farmers, not simply to provide the crop with the nitrogen it needs to grow.⁸³

Specifically, the MRTN calculates a ratio of the cost of commercial nitrogen fertilizer to the expected sale price for that crop. For example, if anhydrous ammonia fertilizer is being sold for \$0.30/lb.-N, and the price of corn is \$3.00 per bushel, the ratio will be 0.10.⁸⁴ This ratio is then used to determine how much nitrogen should be applied to a field to achieve the most *cost-effective* outcome.⁸⁵ Plants can only use a certain amount of nitrogen—at some point, plants stop taking in nitrogen from the soil and further application will produce no additional plant growth. However, at a certain point before plants reach this maximum growth, the incremental increase of nitrogen applied to the crop will produce a diminishing return in terms of crop yield.⁸⁶ Thus, the cost of adding that extra fertilizer to achieve the smaller potential growth becomes less cost-effective for the farmer.⁸⁷ The MRTN identifies the crucial point that produces the *maximum economic return for the farmer*. Beyond that point, the revenue generated from the additional bushels produced by additional fertilizer will (in theory) be less than the cost of the extra fertilizer applied to produce those bushels.⁸⁸ But if fertilizer is cheap, the MRTN system recommends additional applications

⁸¹ See Iowa State Univ. Agronomy Extension & Outreach, *Corn Nitrogen Rate Calculator* (2020) [hereinafter “Corn Nitrogen Calculator”], available at <http://cnrc.agron.iastate.edu/>.

⁸² See *id.*

⁸³ See Manure Nitrogen Rates for Corn, *supra* note 75, at 1.

⁸⁴ Jones, *supra* note 35, at 5-6.

⁸⁵ Corn Nitrogen Rate Calculator, *supra* note 78.

⁸⁶ Jones, *supra* note 35, at 5.

⁸⁷ *Id.*

⁸⁸ *Id.* at 6.

in the hope that additional grain yields will occur, even if plants are unlikely to need the additional nitrogen and nitrogen loss to groundwater is highly likely. For this reason, the MRTN does not strictly focus on the magnitude of the grain yield or the crop needs for nitrogen, but instead on the economic return to the farmer.⁸⁹

The recommendations generated by the MRTN system do not align with the Land Application Rule's requirement that manure application be limited to "expected crop nitrogen needs" for nonlegumes or "expected nitrogen removal" for legumes.⁹⁰ Contrary to the rule's language, the recommendations identified by the Proposed General Permit do not in fact define "expected crop nitrogen needs" or "expected nitrogen removal." Instead, they define the *maximum economic return to nitrogen* for farmers. The growth needs of a plant are not the same as a farmer's desire to maximize economic return. Actual crop nitrogen needs are dependent on a number of variables, including the timing, intensity, and total amount of precipitation; amount of sunshine; insect, weed, and disease pressures; other nutrient deficiencies (such as phosphorus, potassium, and sulfur); the amount of soil organic matter (which breaks organic nitrogen down into a form plants can use); and soil type and texture.⁹¹ The MRTN system includes no variables for these factors. Instead the MRTN recommendations are explicitly based on *fertilizer and crop price*, not *crop needs*, and accordingly these recommendations allow manure applications that likely exceed crop needs if it appears the farmer may economically profit.

⁸⁹ *Id.* at 6.

⁹⁰ Minn. R. 7020.2225, subp. 3(A).

⁹¹ Jones, *supra* note 35, at 3. Notably, the MPCA fact sheet recognizes that some fields can be highly productive without applying the maximum MRTN, based on different conditions. See Manure Nitrogen Rates for Corn, *supra* note 75, at 1. For example, the fact sheet acknowledges that fields in southeastern Minnesota with loess soils need less nitrogen to maximize yields. *Id.* But MPCA provides no recommendation for what the nitrogen level should be in these situations.

Because the section of the Proposed General Permit that identifies the MPCA fact sheets and Extension Service websites is based on the MRTN, the Proposed General Permit is inconsistent with the requirements of the Land Application Rule. The MPCA must adjust the recommendation to reflect the rule's requirement that the application rate must be strictly based on expected crop nitrogen needs and expected nitrogen removal. The Clean Water Organizations therefore propose that Section 13.3 be revised as follows:

The Permittee shall ~~control~~limit manure application rates so the estimated nitrogen available to crops from all nitrogen sources (including commercial fertilizer) does not exceed expected annual crop nitrogen needs for non-legumes and expected nitrogen removal for legumes. Expected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes must be based on the most recent published recommendations of the University of Minnesota Extension Service, but must not be based on recommendations incorporating cost-factors for nitrogen fertilizer (i.e., MRTN system).~~based on the most recent recommendations of the MES and the MPCA fact sheets "Manure Nitrogen Rates For Corn Production (wq f8-18)" and "Manure Management For Corn On Irrigated Sandy Soils (wq f8-52)".~~ The Permittee may use recommendations for annual crop nitrogen needs from another land grant college in a contiguous state ~~may be utilized in the MMP~~ provided the field and climate conditions at the land application site are similar to those within the contiguous state, and do not incorporate cost-factors as set forth above. [Minn. R. 7020.2225]

2. The MRTN for manure should not be calculated using a lower cost ratio than that used for commercial nitrogen fertilizer.

The manure application rates identified by Extension Service are also improper and inconsistent with the Land Application Rule because the rates are formulated based on the cost of commercial nitrogen fertilizer and often produce excessive results when used for manure. If MPCA uses the MRTN recommendations, at a minimum those recommendations should be the same for manure as for commercial fertilizer. After all, expected crop nitrogen needs should not change based on whether the farmer applies commercial fertilizer or manure.

As explained above, the MRTN is calculated based on the ratio of the cost of *commercial nitrogen fertilizer* to the expected sale price of the crop. Minnesota's recommendations for the

MRTN for commercial fertilizer include calculations that use ratios of 0.05, 0.10, 0.15, and 0.20 to account for price fluctuations in fertilizer and corn.⁹² However, because the ratio of the prices of fertilizer to corn has remained approximately the same, the 0.10 ratio usually been used for commercial fertilizer recommendations in Minnesota.⁹³

For manure, considerations are different. Often, the farmer owns or manages livestock and may obtain manure without paying for it.⁹⁴ Presumably to account for that fact that manure is cheaper than fertilizer, the Extension Service recommendations identified in the Proposed General Permit do not use the 0.10 ratio that would be used for commercial fertilizer. Instead, the recommendations use the 0.05 ratio.⁹⁵

This leads to a significantly larger nitrogen recommendation for manure application than for commercial fertilizer, Dr. Jones explains. As an example, using the 0.10 ratio for corn grown after soybeans produces a recommended MRTN of 131 lb. N/acre, with a profitable range of 118–144 lb. N/acre.⁹⁶ Using the 0.05 ratio, by contrast, increases the MRTN Rate to 150 lb. N/acre and the profitable range to 135–169 lb. N/acre.⁹⁷ Thus, under the Extension Service recommendations, for the same field, a farmer could add 19 lb. N/acre when applying manure instead of commercial fertilizer. These two examples are shown below in Figure 1:

⁹² Daniel Kaiser, et al., Univ. of Minn. Extension, *Fertilizing Corn in Minnesota* (2020), <https://extension.umn.edu/crop-specific-needs/fertilizing-corn-minnesota#standard-n-guidelines-2237060>, attached as Ex. 17.

⁹³ Dr. Gyles Randall, *Expert Report 1* (2020), attached as Ex. 2.

⁹⁴ Jones, *supra* note 35, at 7.

⁹⁵ Manure Nitrogen Rates for Corn, *supra* note 75; Guidelines for Manure Application, *supra* note 40.

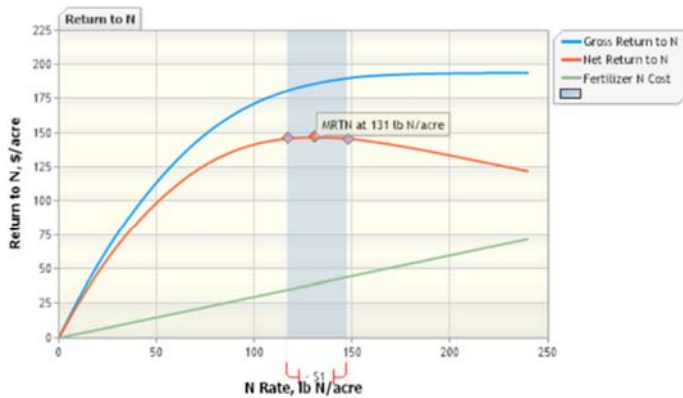
⁹⁶ Jones, *supra* note 35, at 7.

⁹⁷ *Id.*

Rates and Charts

State: Minnesota
 Number of sites: 121
 Rotation: Corn Following Soybean

Nitrogen Price (\$/lb):	0.30
Corn Price (\$/bu):	3.00
Price Ratio:	0.10
MRTN Rate (lb N/acre):	131
Profitable N Rate Range (lb N/acre):	116 - 147
Net Return to N at MRTN Rate (\$/acre):	\$146.86
Percent of Maximum Yield at MRTN Rate:	99%
Anhydrous Ammonia (82% N) at MRTN Rate (lb product/acre):	159
Anhydrous Ammonia (82% N) Cost at MRTN Rate (\$/acre):	\$39.30



Rates and Charts

State: Minnesota
 Number of sites: 121
 Rotation: Corn Following Soybean

Nitrogen Price (\$/lb):	0.15
Corn Price (\$/bu):	3.00
Price Ratio:	0.05
MRTN Rate (lb N/acre):	150
Profitable N Rate Range (lb N/acre):	135 - 169
Net Return to N at MRTN Rate (\$/acre):	\$168.13
Percent of Maximum Yield at MRTN Rate:	99%
Anhydrous Ammonia (82% N) at MRTN Rate (lb product/acre):	182
Anhydrous Ammonia (82% N) Cost at MRTN Rate (\$/acre):	\$22.50

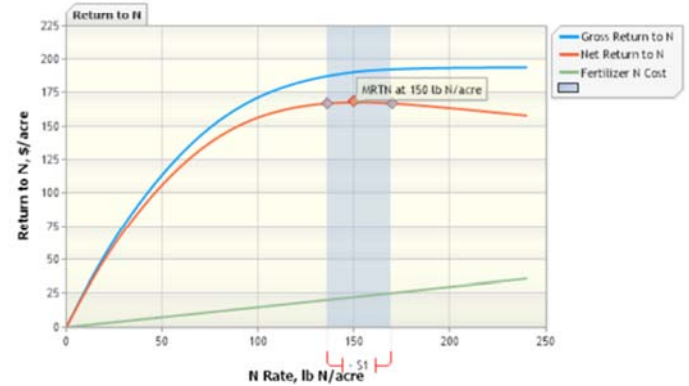


Figure 1. Two scenarios using the MRTN Calculator for commercial anhydrous ammonia (left) and manure (right), at current prices for N fertilizer and corn, using the Proposed General Permit's guidelines for manure application rate at 0.05 MRTN.⁹⁸

Importantly, the orange line's downward slope to the right of the MRTN shows that a farmer who uses commercial fertilizer beyond the MRTN will incur an economic penalty.⁹⁹ By contrast, as Dr. Jones explains, "there is almost no economic consequence for the farmer to keep applying manure far beyond the MRTN rate, which is already 19 lbs./acre higher than the recommended rate using commercial nitrogen."¹⁰⁰ In addition, the difference between the total net return to the farmer for commercial fertilizer and manure is notable. When using commercial fertilizer at the 0.10 MRTN rate, the farmer achieves a net return of \$146.86/acre. When using

⁹⁸ *Id.* at 7.

⁹⁹ *Id.*

¹⁰⁰ *Id.*

manure, the farmer could achieve that same net return using an application rate far below the 0.05 MRTN rate—about 80 lbs./acre in this example.¹⁰¹ Clearly, the farmer using manure can achieve economic parity with the farmer using commercial fertilizer, even while applying manure at a rate far below the Extension Service recommendations.¹⁰² But, according to Dr. Jones, “the Extension Service guidelines do quite the opposite—they encourage application of [nitrogen] far beyond that threshold.”¹⁰³

For this additional reason, the Extension Service’s recommendations, which are referenced in the Proposed General Permit, do not comply with the Land Application Rule requirement that limits manure application to “expected crop nitrogen needs” or “nitrogen removal rates.” The actual crop needs for nitrogen do not change based on whether a farmer applies commercial nitrogen fertilizer or manure, or based on a change in the cost of fertilizer. Accordingly, if the MPCA elects to use the MRTN, it is unreasonable and inconsistent with the Land Application Rule to use a different MRTN for commercial fertilizer than for manure.¹⁰⁴ If the 0.10 MRTN rate provides sufficient nitrogen for plant growth when commercial fertilizer is used, that same rate will provide sufficient nitrogen to meet the expected crop nitrogen needs or nitrogen removal rates when manure is used.¹⁰⁵

Accordingly, if the MPCA determines that the recommended rate should remain the MRTN, the Clean Water Organizations propose that Section 13.3 be revised as follows:

¹⁰¹ *Id.*

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ Notably, one of the original MRTN developers has stated that the price of commercial nitrogen fertilizer *should* be used to calculate the MRTN ratio for manure, instead of the lower rate indicating that manure is less expensive. Randall, *supra* note 90, at 1.

¹⁰⁵ Maximizing the amount of manure to apply is particularly inappropriate when the Land Application Rule already allows farmers to deviate up to 20% in excess of recommendations when needed under the circumstances. Minn. R. 7020.2225, subp. 3(A)(2).

The Permittee shall ~~control~~limit manure application rates so the estimated nitrogen available to crops from all nitrogen sources (including commercial fertilizer) does not exceed expected annual crop nitrogen needs for non-legumes and expected nitrogen removal for legumes. Expected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes must be based on the most recent published recommendations of the University of Minnesota Extension Service, but must not be based on recommendations incorporating cost-factors for nitrogen fertilizer (i.e., MRTN system) unless the MRTN recommendation used is based on a cost factor of at least 0.10. ~~based on the most recent recommendations of the MES and the MPCA fact sheets "Manure Nitrogen Rates For Corn Production (wq-f8-18)" and "Manure Management For Corn On Irrigated Sandy Soils (wq-f8-52)".~~ The Permittee may use recommendations for annual crop nitrogen needs from another land grant college in a contiguous state ~~may be utilized in the MMP~~ provided the field and climate conditions at the land application site are similar to those within the contiguous state, and if the recommendations are based on the MRTN, they use a cost factor of at least 0.10. [Minn. R. 7020.2225]

B. Section 13.3(a): Pre-Plant Testing For Nitrate.

Next, the Clean Water Organizations request that MPCA add back into the Proposed General Permit a section relating to pre-plant testing for nitrate. MPCA included such a section in the 2016 General Permit, and it is needed to comply with the Minnesota Rules and to ensure that farmers are not over-applying manure that will cause water pollution.

The Land Application Rule requires that manure management plans include “plans for soil nitrate testing in accordance with University of Minnesota Extension Service recommendations.”¹⁰⁶ Under the rules, any required testing must be sufficient to yield representative data to determine whether a permittee is complying with the conditions of the permit and state rules.¹⁰⁷ In this case, the Land Application Rule and the Proposed General Permit require farmers to limit manure applications to “expected crop nitrogen needs” or “nitrogen removal rates.” The Land Application Rule and the Proposed General Permit also require that in calculating these amounts, farmers consider *all* sources of nitrogen available to their crops, including

¹⁰⁶ *Id.*, subp. 4(D)(12).

¹⁰⁷ Minn. R. 7001.0150, subp. 2(B).

“commercial fertilizer nitrogen, soil organic matter, irrigation water, legumes grown during previous years, biosolids, process wastewater, and manure applied for the current year and previous years.”¹⁰⁸ Accordingly, nitrate testing is needed to ensure that farmers properly account for all nitrogen sources, and that farmers do not apply nitrogen in excess of expected crop nitrogen needs. In short, farmers cannot limit their application to the crop’s expected nitrogen needs if they do not know how much nitrogen is already in the soil, and they cannot know how much nitrogen is in the soil without testing.

Determining how much nitrogen farmers should credit from previous years is not an easy task without testing. Many factors affect how much residual nitrogen remains in the soil, including the previous crop grown, the soil texture, and historic rainfall.¹⁰⁹ One of the most important factors—with the most difficult-to-predict effects—is the amount of residual nitrates that remain from manure applied in previous years.¹¹⁰ As the Extension Service explains, microbes require several years to mineralize organic forms of nitrogen in manure into nitrate that can be used by plants, and the length of the process depends on soil moisture and temperature conditions.¹¹¹ Accordingly, manure applied in one growing season will continue to provide nitrate to plants for several growing seasons.¹¹² The amount of residual nitrogen, however, can vary greatly, is difficult to predict, and can have substantial effects on the amount of preplant nitrogen that should be added to the soil.¹¹³ As Dr. Randall explains, a soil test of 13 sites where manure had been applied in the

¹⁰⁸ Minn. R. 7020.2225, subps. 3(A)(1), (A)(3)

¹⁰⁹ Univ. of Minn. Extension, *Soil Testing for Corn Nitrogen Recommendations* (2018), <https://extension.umn.edu/nitrogen/soil-testing-corn-nitrogen-recommendations>, [hereinafter “Soil Testing for Corn”], attached as Ex. 18.

¹¹⁰ *Id.*

¹¹¹ Manure Characteristics, *supra* note 41, at 6.

¹¹² *Id.*

¹¹³ *Id.*; see also Randall, *supra* note 90, at 2.

previous five years showed that the amount of nitrogen to be applied should be reduced by an average of 43 lb. N/acre based on the residual nitrogen.¹¹⁴ For several sites, the recommended rate of nitrogen to be applied was reduced by 70 lb. N/acre, and for others it was reduced by only 19 lb. N/acre, showing the wide range of results that manure application can have at different fields.¹¹⁵

Accounting for nitrates released from manure over time can be done using a “credit” for manure from the previous two years.¹¹⁶ But the crediting system cannot precisely account for the actual amount of nitrates, and in some cases may result in excessive fertilizer recommendations.¹¹⁷ Measuring nitrates in the soil is more reliable than other methods of estimating the need for additional nitrogen application.¹¹⁸ As the Iowa State University Extension Service explains, using a late-spring test for soil nitrate “should help corn producers manage N to increase their profits while reducing environmental degradation.”¹¹⁹

Currently, the Proposed General Permit does not include any requirement for soil testing for nitrogen, although it does require soil testing for phosphorus.¹²⁰ The 2016 General Permit, however, *does* require soil nitrate testing “according to the method and frequency recommended by the most recent MES-published guidelines.”¹²¹ It is unclear why MPCA removed this requirement in the Proposed General Permit. To comply with the requirements of the Land

¹¹⁴ Randall, *supra* note 94, at 2.

¹¹⁵ *Id.*

¹¹⁶ Manure Characteristics, *supra* note 41, at 4.

¹¹⁷ Soil Testing for Corn, *supra* note 106, at 4 (explaining that using the standard manure nitrogen crediting system without a soil test when manure was applied in October or November “may result in high fertilizer recommendations if significant residual nitrogen was present before the manure was applied.”)

¹¹⁸ A.M. Blackmer et al., Iowa State Univ. Extension Serv., *Nitrogen Fertilizer Recommendations for Corn in Iowa* 4 (1997), attached as Ex. 19.

¹¹⁹ *Id.* at 1.

¹²⁰ See Proposed General Permit, *supra* note 75, § 12.6.

¹²¹ Minn. Pollution Control Agency, *NPDES General Permit for Concentrated Animal Feeding Operations* § 4.5.4 (2016).

Application Rule and ensure farmers are able to accurately determine the proper amount of manure they should apply, the Clean Water Organizations propose that the following language be added to the Proposed General Permit:

The Permittee shall ensure that fields receiving manure are sampled and tested for soil nitrates according to the method and frequency recommended by the most recent MES-published guidelines. The Permittee shall use the results of the sample in calculating a residual N credit. [Minn. R.7020.2225, subp. 3.A(3)].

C. Section 14.6: October Restrictions On Manure Application.

The Clean Water Organizations also request changes to the section regarding October Restrictions on Manure Application to better guard against nitrate pollution. The Clean Water Organizations appreciate that the Proposed General Permit now requires best management practices (“BMPs”) for any manure application in October, but believes that those requirements should be strengthened to further protect water quality.

First, with regard to the soil temperature, the proposed language provides no direction about how to determine soil temperature. This is important, because fall manure application when temperatures exceed 50° F is highly likely to cause nitrate pollution. In such cases, the organic nitrogen will be mineralized to inorganic nitrate at a time when the crops are not growing.¹²² Then, the nitrate will remain in the soil until the crop takes it up, possibly not until the following June.¹²³ The longer the nitrate remains in the soil, the more likely it is to leach into the groundwater—particularly during heavy rains in the fall or early spring.¹²⁴ Accordingly, ensuring that soil temperatures prior to manure application are below 50° F, and are likely to *remain* that way until spring, is critical. Allowing farmers to apply manure as soon as their area has one 50° F soil

¹²² Fred Madison et al., Univ. of Wis. Extension Serv., *Guidelines for Applying Manure to Cropland and Pasture in Wisconsin* 11 (2014), <https://soilsextension.webhosting.cals.wisc.edu/wp-content/uploads/sites/68/2014/02/A3392.pdf>, attached as Ex. 20.

¹²³ Randall, *supra* note 90, at 2.

¹²⁴ *Id.* at 2; Madison, *supra* note 119, at 11.

temperature reading will not prevent nitrate leaching, as mineralization to nitrate will begin again if the soil temperatures rise after manure application. To ensure consistency, Dr. Randall recommends that soil temperature readings be taken at a depth of six inches and be less than 50 degrees for three consecutive days before farmers apply manure.¹²⁵

Second, with regard to cover crops, the Proposed General Permit indicates manure may be applied in October if a cover crop “is established in accordance with the requirements of this Permit for June, July, August, or September applications.” But the likelihood that a cover crop can be established drops quickly after the first half of September, particularly in the northern half of the state.¹²⁶ After October 1, establishing a cover crop would be very difficult even in southern Minnesota and extremely unlikely in northern Minnesota.¹²⁷ To effectively prevent nitrate pollution, a cover crop must not merely be germinated—it must be well-established and sufficiently robust to take up a substantial amount of nitrate from the manure.¹²⁸ This means the crop must be well-grown—perhaps six to eight inches tall—by mid-to-late October.¹²⁹ A cover crop planted in October is extremely unlikely to fulfill its intended function as a temporary fixer of nitrates.¹³⁰ But the Proposed General Permit would allow a farmer to seed a cover crop in October within 10 days of manure application and hope for the best—and there would be no way to remove the manure if the cover crop does not sprout. Any manure applied under these circumstances is very likely to mineralize to nitrate and leach into the groundwater.¹³¹ If, however,

¹²⁵ Randall, *supra* note 90, at 3. For the same reason, this standard—three consecutive days of temperatures below 50 degrees, measured at a soil depth of six inches below the surface—also should be added to section 14.4, relating to manure application on coarse-textured soils.

¹²⁶ Randall, *supra* note 90, at 3.

¹²⁷ *Id.*

¹²⁸ *Id.*

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ *Id.*

a cover crop has already been established prior to October, application of manure through an injector into the growing cover crop could be a potential BMP.¹³² Therefore, the Proposed General Permit should be revised to indicate that cover crops may be used as a BMP for October manure application only if the cover crop has been planted in a previous month and already established before the October application.

Third, for the split application of nitrogen, the Proposed General Permit does not indicate when the second half of the nitrogen could be applied. Applying the second half of the manure soon after the first half—in early November, for example—would negate the effectiveness of splitting the nitrogen application. And manure application during the winter months, to frozen or snow-covered soils, is prohibited or subject to strict conditions under the terms of the permit.¹³³ Even under those conditions, winter manure application is risky and likely to lead to runoff, as explained in the next section. Under no circumstances should applying manure during winter months be considered a BMP. Accordingly, the Proposed General Permit should specify that the second half of the split application of nitrogen should be applied only in the spring, when the ground is no longer frozen.

Finally, the Proposed General Permit does not require implementation of BMPs during an “emergency” manure application, perhaps on the assumption that BMPs would not be feasible. But in some cases, farmers may in fact be able to implement these BMPs despite an emergency. For example, a nitrogen stabilizing agent potentially could be added to the manure before spreading, despite poor weather conditions or equipment failure that prevented an earlier manure

¹³² *Id.*

¹³³ See Proposed General Permit, *supra* note 75, §§ 14.8, 14.10.

application.¹³⁴ In such cases, when following the BMPs remains feasible, farmers should not be excused from following the BMPs intended to prevent nitrate pollution.

Accordingly, to better protect water quality, the Clean Water Organizations propose the following revisions to Section 14.6:

October Restrictions - The Permittee shall not apply manure in October to harvested fields unless at least one of the following nitrogen BMPs are implemented:

- a) Soil temperature ~~is~~ has been below 50 degrees for three consecutive days at the time of manure application based on temperatures taken six inches below the soil surface;
- b) A nitrogen stabilizing agent/product is added at the recommended inclusion rates;
- c) A cover crop ~~is~~ has been established prior to October in accordance with the requirements of this Permit for June, July, August, or September manure applications; or
- d) A split application of nitrogen is used where no more than 1/2 of the recommended nitrogen rate is applied before October 31 and the remainder is applied after April 1 or after the soil is no longer frozen or snow-covered, whichever is later.

~~Alternatives developed by a land grant University can be used if approved by the MPCA and included as part of the approved MMP.~~

Nitrogen BMP implementation is ~~not~~ required for emergency manure application, as defined by this Permit, unless implementation of BMPs is infeasible due to the emergency conditions necessitating the application. [Minn. R. 7001.0150]

D. Section 14.8: Winter Application Of Solid Manure.

Similarly, while the Clean Water Organizations appreciate MPCA's efforts to strengthen the Proposed General Permit's section on winter application of solid manure, a broader prohibition could make this section even stronger. Prohibiting application of solid manure in December and January, along with February and March, will provide even better protection against nitrate pollution.

¹³⁴ See *id.* § 30.19 (defining "emergency manure application").

When farmers apply manure to snow-covered or frozen soil, nutrients cannot soak into the soil, and the potential for nitrate loss is “extremely high.”¹³⁵ When farmers apply manure during the winter months, the majority of the inorganic nitrogen is likely to be lost to the air through volatilization.¹³⁶ And winter-applied manure is very likely to be “carried off to lakes and streams during thaws or during winter or early spring rains.”¹³⁷ For these reasons, the Proposed General Permit contains a prohibition on applying solid manure during February and March. However, these same considerations apply with equal force to December and January, when the ground is also likely to be frozen or snow-covered.¹³⁸ Accordingly, the Clean Water Organizations propose the following revision:

Winter application of solid manure - Winter application of solid manure during the months of [December, January](#), February and March is prohibited. When allowed, winter application must comply with all of the following:

- a) Manure is applied on fields identified in the MPCA approved MMP for winter application;
- b) Manure is applied more than 300 feet from sensitive features including lakes, streams, open tile inlets, sinkholes, water supply wells, mines and quarries, intermittent streams, un-bermed drainage ditches, or public water wetlands;
- c) Air temperatures are less than 40 degrees Fahrenheit during, and for at least 24 hours from the end of, the application process when two or more inches of snow are on the field;
- d) Less than a 50% probability of rainfall in excess of 0.25 inches predicted by the National Weather Service within 24 hours of the end of the application period;
- e) Slopes are less than or equal to six percent on the entire portion of the field where manure is land applied;

¹³⁵ Manure Timing, *supra* note 52. This Extension Service publication recommends, unless there is an emergency, “Do not apply in winter.” *Id.*

¹³⁶ Soil Testing for Corn, *supra* note 106, at 4.

¹³⁷ Madison et al., *supra* note 119, at 15.

¹³⁸ If the ground is not frozen or snow-covered in December or January, then the application would not qualify as a “winter manure application” under the Proposed General Permit definition and therefore would not be prohibited. See Proposed General Permit, *supra* note 75, § 30.53.

f) Water or ice do not occupy tillage furrows to the extent that additional snowmelt or precipitation cannot be contained between furrows or in other depressions within the field; and

g) Fields used for land application meet a total phosphorus loss risk index number of two or less (low to very low relative risk) as calculated according to the Minnesota Phosphorus Index.

In the event of significant snow accumulation within animal holding areas, the Permittee may obtain approval from the MPCA for winter application of the snow and manure-snow mix during [December, January](#), February and March. If approved, the application fields must, at a minimum, meet the requirements above. Additional measures/practices may be required by the MPCA. [Minn. R. 7001.0150]

E. Section 11.4: Review Of Manure Management Plan.

Finally, revising Section 11.4 to require farmers to identify fields in manure management plans (“MMP”) using GIS information will assist MPCA staff. Using GIS information will make it easier for MPCA to determine whether any fields receive double applications of manure because they are identified in more than one MMP and receiving manure from more than one farmer.

Pursuant to the Land Application Rule, MMPs “must include acreage available for manure and process wastewater application including maps or aerial photos showing field locations and areas within the fields that are suitable for manure or process wastewater application.”¹³⁹ The rule, accordingly, requires farmers to specifically identify fields in the MMPs. Identification through GIS information will make descriptions on MMPs more readily comparable for MPCA staff. Under the current system, two applicants could describe the same field using different descriptors, and determining whether there is overlap between two plans is cumbersome for MPCA staff, who must compare different maps or aerial photographs to determine whether the same field has been identified in more than one MMP. Using GIS information would standardize descriptions of fields

¹³⁹ Minn. R. 7020.2226, subp. 4(D)(3).

in the MMPs, making it clear to both MPCA staff and applicants which fields are being referred to in the MMP.

Accordingly, the Clean Water Organizations propose the following revision to Section 11.4:

The Permittee shall annually review and update the approved MMP to ensure that it meets all applicable requirements. The annual review and update shall include information for each field where manure will be applied during the following growing season. The permittee shall provide an area delineation of each manure application site in a GIS polygon geospatial file format (.kml, .shp, .json, etc.) with detailed coordinate system information, including a description of the site. Annual updates to the MMP do not require a modification of coverage under this Permit provided the updates are consistent with the methodology of the approved MMP. [Minn. R. 7001.0190, Minn. R. 7020.2225]

IV. THE CLEAN WATER ORGANIZATIONS REQUEST A CONTESTED CASE HEARING

The Clean Water Organizations request a contested case hearing on the issue of whether the recommendation MPCA has referenced in Section 13.3 of the Proposed General Permit is consistent with “expected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes” as required by the Land Application Rule.

The information required by Minn. R. 7000.1800 is provided below.

1. Statement of reasons or proposed findings supporting an MPCA decision to hold a contested case hearing.

(A) *There is a material issue of fact in dispute concerning this matter.*

As noted in the Clean Water Organizations’ comments above in section V.A, the Proposed General Permit references recommendations from the University of Minnesota that incorporate economic risk and cost factors unrelated to the amount of nitrogen a typical crop¹⁴⁰ will actually need or remove to support plant growth. As a result, these recommendations are inconsistent with

¹⁴⁰ MCEA notes that Minn. R. 7020.2225, subp. 3 already provides for increased nitrogen application if conditions particular to the crop or field require additional applications to secure the crop.

what the Land Application Rule requires and will allow permittees to apply manure at rates resulting in excess loss of nitrate to the groundwater, exacerbating the issues the Clean Water Organizations describe in section II.B above. Whether the recommendations conform to the objective requirement of the rule is a factual issue that can be resolved with expert testimony.¹⁴¹ This expert testimony will identify the results of research into “expected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes,” why the economic components incorporated into the current recommendation result in applications not supported by the scientific data, and why the recommendations will lead to excess application inconsistent with the text and intent of MPCA’s land application rule.

(B) *The MPCA has the jurisdiction to make a determination on this issue.*

In the proposed general permit, MPCA has referenced a particular recommendation of the Extension Service. If MPCA agrees with the Clean Water Organizations that the recommendation it references is not consistent with the standard established by the Land Application Rule, MPCA could ask the Extension Service to modify its recommendation, or MPCA could modify the Proposed General Permit to ensure that a modified version of the Extension Service’s recommendations are referenced in the Proposed General Permit. As a result, this issue is within MPCA’s jurisdiction.

(C) *There is a reasonable basis underlying the disputed material issue of fact or facts such that the holding of a contested case hearing would allow the introduction of information that would aid the MPCA in resolving the disputed facts in making a final decision on the matter.*

¹⁴¹ See *In re City of Owatonna’s NPDES/SDS Proposed Permit Reissuance for the Discharge of Treated Wastewater*, 672 N.W.2d 921, 928 (Minn. Ct. App. 2004) (finding a fact issue supporting a contested case hearing request existed when relator submitted expert affidavits and a report challenging MPCA’s interpretation of its modeling and explaining, “When experts disagree, a fact question arises.”)

The Clean Water Organizations support this request with two expert reports, by Dr. Christopher Jones, research engineer at Iowa State University (attached as Exhibit 1) and Dr. Gyles Randall, professor emeritus at the University of Minnesota (attached as Exhibit 2).¹⁴² These experts will testify that the recommendation currently included in the Proposed General Permit is not consistent with the standard established by the Land Application Rule.¹⁴³ These experts will base their testimony on research conducted in Minnesota and Iowa. These experts will demonstrate that the economic factors incorporated into the current recommendations, particularly as applied to manure, result in excess application inconsistent with “expected crop nitrogen needs, crop nitrogen removal rates, and estimated plant available nitrogen from manure and legumes” and that this excess application can be predicted to lead to enhances nitrogen loss to the groundwater.

2. A statement of the issues proposed to be addressed by a contested case hearing and the specific relief requested or resolution of the matter.

The issue to be addressed by a contested case hearing is whether the recommendation referenced in the Proposed General Permit conforms to the standard established by the Land Application Rule. The relief requested is amendment of the Proposed General Permit to include a recommendation that will result manure application rates consistent with plant needs established by scientific research, as required by the Land Application Rule.

Clean Water Organization has identified two changes that MPCA could make to the Proposed General Permit to address this issue, in section V.A, above. First, MPCA could request the Extension Service to prepare a recommendation that does not include the economic factors on which the current MRTN recommendation is based. Second, MPCA could request the Extension

¹⁴² See Jones, *supra* note 35; and Randall, *supra* note 90.

¹⁴³ See *City of Owatonna*, 672 N.W.2d at 929 (explaining that relator had sufficiently supported the requested for a contested case hearing when it submitted affidavits of experts who challenged MPCA’s methodology and interpretation of the modeling at issue).

Service to prepare a recommendation specific to manure that utilizes the MRTN, but includes a higher cost factor ratio similar to the one used for commercial fertilizer, which is less likely to result in over-application of manure.

3. Witnesses, exhibits, and estimate of time.

At a contested case hearing, the Clean Water Organizations would intend to present the following witnesses: Dr. Christopher Jones and Dr. Gyles Randall. Proposed exhibits would include all exhibits attached to this comment or referenced herein. The estimated time for the contested case hearing would be a half-day. The Clean Water Organizations reserve the right to introduce other witnesses or exhibits in accordance with Minn. R. 7000.1800, subp. 2(C). The Clean Water Organizations note that MCEA has been seeking a meeting with MPCA and Extension Service representatives to discuss the use of MRTN recommendations, which could lead to changes that would resolve this issue without a contested case hearing.

CONCLUSION

While the Clean Water Organizations appreciate that the Proposed General Permit makes some incremental changes that are likely to help improve water quality, the Clean Water Organizations' position is that the Proposed General Permit will allow the continued pollution of Minnesota's water, endangering drinking water and aquatic life. Already, hundreds of thousands of Minnesotans are drinking water with elevated levels of nitrates, which will increase their risks of cancers and other health problems. If farmers are allowed to continue to apply manure to their fields in excess of crop nitrogen needs, and at times and using methods that pose high risk of nitrate leaching and runoff, dangerous nitrate pollution will continue to increase across Minnesota. Accordingly, the Clean Water Organizations respectfully request that MPCA revise the Proposed General Permit as follows:

- (1) revise Section 13.3 to limit manure application rates to “expected crop nitrogen needs” or “expected nitrogen removal”; or in the alternative, to ensure that the MRTN uses a cost factor of at least 0.10;
- (2) add Section 13.3(a) to require pre-plant testing for nitrate according to Extension Service recommendations;
- (3) revise Section 14.4 to require soil temperature measurements below 50 degrees for three consecutive days, measured at a soil depth of six inches below the surface;
- (4) revise Section 14.6 to strengthen October restrictions on manure application;
- (5) revise Section 14.8 to prohibit application of solid manure in December and January; and
- (6) revise Section 11.4 to require GIS field identification in MMPs.

Respectfully submitted,

MINNESOTA CENTER FOR ENVIRONMENTAL ADVOCACY

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