

IOWA DEPARTMENT OF NATURAL RESOURCES

Petition by the Iowa Environmental Council and Environmental Law and Policy Center for the adoption of rules relating to animal feeding operations	PETITION FOR RULE MAKING
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The Iowa Environmental Council and Environmental Law & Policy Center present this petition for rule making pursuant to 567 IAC 5.1 and the Uniform Rules on Agency Procedure. The petition requests revision of rules relating to the siting of animal feeding operations. The revisions requested in this petition are based on the need to protect water quality, specifically as it relates to karst topography, groundwater and drinking water sources. The petition requests that the Iowa Department of Natural Resources (“DNR”) promulgate revised rules governing animal feeding operations.

1. Relevant Law

The Iowa Legislature has charged the Environmental Protection Commission (EPC) with adopting requirements regarding the construction of animal feeding operations (AFOs). Iowa Code section 459.103(1) states:

The commission shall establish by rule adopted pursuant to chapter 17A, requirements relating to the construction, including expansion, or operation of animal feeding operations, including related animal feeding operation structures. The requirements shall include but are not limited to minimum manure control, the issuance of permits, and departmental investigations, inspections, and testing.

This statute gives the EPC broad authority to regulate AFO siting and construction requirements.¹

More generally, the EPC has broad statutory authority to “Develop comprehensive plans and programs for the prevention, control and abatement of water pollution.”² No other department or commission has this duty – only the EPC has authority to adopt rules for water quality protection.

¹ See also IOWA CODE § 455B.173(12) (providing the EPC authority to “Adopt, modify, or repeal rules relating to the construction or operation of animal feeding operations, as provided in sections relating to animal feeding operations provided in chapter 459, subchapter III”).

² IOWA CODE § 455B.173.

2. Summary of Argument in Support of the Proposed Rules

Iowa law restricts the siting of animal feeding operations to protect water quality from manure pollution. The law includes specific protections for karst terrain, groundwater, and drinking water sources. The rules implementing the statute have not been effective at protecting water quality and must be revised.

Iowa Code prohibits unformed concentrated animal feeding operation (CAFO) manure structures above karst terrain. Formed concrete structures are allowed with certain protections in place. But scholarship on karst shows that there is risk in building CAFOs on karst terrain even with those protections,³ and the rules should address that risk. The rules should require greater vertical separation distance from karst terrain and recommendations in rule should be transformed into requirements.

To protect Iowa's drinking water, Outstanding Iowa Waters, and other waters of the state, the DNR must adopt rules requiring water pollution monitoring systems, consideration of environmental factors, and the adoption of additional minimum requirements for the approval of new construction. Doing so will protect Iowa's waters and provide clearer requirements for owners and operators attempting to construct or expand a CAFO or feedlot operation. Moreover, clear requirements will provide greater transparency for the public in understanding how CAFOs are sited.

A brief in support of the proposed rules is attached (see Attachment A).

3. Summary of Data in Support of the Proposed Rules

A. Concentrated Animal Feeding Operations Rapidly Expanded in Iowa.

The number of animal feeding operations in Iowa has grown significantly over the last 30 years. Most of the growth has been in the form of large concentrated animal feeding operations, primarily hog and hen confinements. In 1990, Iowa had 789 large CAFOs.⁴ By 2019, the number of large CAFOs quintupled to 3,963, and has continued to grow since 2019.⁵ The total number of animal feeding operations in the state is far larger, including 2,500 facilities that are slightly below the "large CAFO" threshold to avoid regulation, plus thousands of smaller operations.⁶

The growth in the number and size of CAFOs has increased the quantity of manure generated. The

³ See Van Brahana et al., *CAFOs on Karst—Meaningful Data Collection to Adequately Define Environmental Risk, with a Specific Application from the Southern Ozarks of Northern Arkansas*, US GEOL. SURVEY SCI. INVEST. REP. 5035, 97.

⁴ Jamie Konopacky and Soren Rundquist, "EWG Study and Mapping Show Large CAFOs in Iowa Up Fivefold Since 1990," Environmental Working Group, Jan. 21, 2020.

⁵ *Id.*; IEC analysis of DNR AFO database, available at <https://programs.iowadnr.gov/animalfeedingoperations/>.

⁶ IEC analysis of DNR AFO database, available at <https://programs.iowadnr.gov/animalfeedingoperations/>.

amount of manure Iowa now generates is equal to a population of 168 million people.⁷ Most of this manure is not treated before being applied to cropland, where it can serve as fertilizer for crops. It can also run off the fields in stormwater, infiltrate soil and pollute groundwater, or reach surface waters via tile drainage. The high volume of manure produced in Iowa has led to areas of the state with manure application at rates that exceed crop needs.⁸ This excess manure application leads to nitrate and phosphorus pollution.

B. Iowans Bear the Consequences and Costs of Excess Manure.

Excess nitrate in sensitive areas increases the risk that nitrate enters groundwater or drinking water sources. Nitrate contamination of drinking water can cause blue-baby syndrome, birth defects, bladder cancer, thyroid cancer, and other cancers.⁹ Additionally, manure runoff from CAFOs into local water sources can promote the growth of harmful algal blooms causing illness in both animals and humans.¹⁰ These adverse health effects to humans include liver damage, neurotoxicity, gastrointestinal problems, and various flu-like reactions. Manure can also contaminate surface water and groundwater with fecal bacteria that can cause gastrointestinal and respiratory illness.¹¹

The cost to remove nitrate and other pollutants attributable to livestock operations from drinking water is astronomical. If the current amount of nitrogen run off from farms fields and CAFOs continues, Iowans will be responsible for up to \$333 million over the next five years to remove nitrates from drinking water.¹² Removing these nitrates through water treatment, rather than preventing them from entering waters at the source of pollution, is costly and often unaffordable for public water systems and unaffordable for some private well owners.¹³ Rural Iowans can pay as much as \$1,200 per person per year for nitrate treatment of drinking water.¹⁴ Cities struggle to cope with the cost of nitrate removal as well, facing high treatment costs for removal.

Harmful algal blooms produce toxins and have led Des Moines Water Works to consider spending \$30 million to drill new wells in order to provide safe water to more than 500,000 people.¹⁵ Bacteria contamination is widespread in surface waters around the state, leading to high rates of contamination of private wells. Iowans cannot afford the continued pollution of their groundwater

⁷ Chris Jones, “50 Shades of Brown,” June 6, 2019, available at <https://www2.iuhr.uiowa.edu/cjones/50-shades-of-brown/>.

⁸ Chris Jones, “Make America MRTN Again,” June 21, 2019, available at <https://www2.iuhr.uiowa.edu/cjones/make-america-mrtn-again> (showing that manure produced in some Iowa counties meets or exceeds crop needs for phosphorus and nitrogen, despite continued sales of commercial fertilizer).

⁹ “The Explosion of CAFOs in Iowa and Its Impact on Water Quality and Public Health.” Iowa Policy Project
¹⁰ *Id.*

¹¹ “Recreational Water Quality Criteria,” U.S. EPA (2012), at 12, available at <https://www.epa.gov/sites/default/files/2015-10/documents/rwqc2012.pdf>.

¹² “Rural Iowans Bear Brunt of Water Treatment Costs for Nitrate Pollution from Farms and CAFOs.” *Union of Concerned Scientists*, 14 Jan. 2021, www.ucsusa.org/about/news/rural-iowans-bear-brunt-water-treatment-costs-nitrate-pollution-farms-and-cafos.

¹³ *Id.*

¹⁴ *Id.*

¹⁵ Merchant, James, and David Osterberg. “The Explosion of CAFOs in Iowa and Its Impact on Water Quality and Public Health.” *Iowa Policy Project*, Iowa Policy Project, Jan. 2018, www.iowapolicyproject.org/2018docs/180125-CAFO.pdf.

and drinking water sources.

4. Text of the Proposed Rule

This petition proposes rule changes to Iowa Administrative Code, title 567, chapter 65.

A. Proposed karst rule changes

- i. Allow for approval of structures less than 25 feet above karst only if designed by NRCS.*

Amend section 65.15, paragraph (14) as follows:

(2) A minimum ~~5~~ 25-foot layer of low permeability soil (1×10^{-6} cm/sec) or rock between the bottom of a formed manure storage structure and limestone, dolomite, or other soluble rock is required if the formed manure storage structure is not designed by ~~a PE or~~ NRCS qualified staff.

(3) If the vertical separation distance between the bottom of the proposed formed manure storage structure and limestone, dolomite, or other soluble rock is less than ~~5~~ 25 feet, the structure shall be designed and sealed by a PE or NRCS qualified staff person who certifies the structural integrity of the structure. A 2-foot-thick layer of compacted clay liner material shall be constructed underneath the floor of the formed manure storage structure. However, it is recommended that any formed manure storage structure be constructed aboveground if the vertical separation distance between the bottom of the structure and the limestone, dolomite, or other soluble rock is less than ~~5~~ 25 feet.

- ii. Prohibit CAFO structures less than 5 feet above karst.*

Amend section 65.15, paragraph (14), by adding the following:

(6) Construction of underground formed and unformed manure storage structures less than 5 feet above karst terrain is prohibited.

B. Proposed drinking water rule changes

- i. Require water pollution monitoring systems*

Amend 65.15(21) by adding the following subsection:

Groundwater monitoring. The department shall require that the owner of a confinement feeding operation install and operate a water pollution monitoring system as part of an unformed manure storage structure.

Amend 65.109(10) by adding the following subsection:

Groundwater monitoring. The department shall require that the owner of an open feedlot install and operate a water pollution monitoring system as part of an unformed manure storage structure.

ii. *Require the consideration of environmental factors in siting*

Amend 65.5(3) as follows:

The department ~~may~~ shall evaluate any proposed confinement feeding operation or proposed expansion of a confinement feeding operation that requires a construction permit or manure management plan with respect to its potential adverse impacts on natural resources or the environment.

...

b. *In addition to the requirements in rules 567-65.9(459,459B), 567-65.10(459,459B), 567-65.11(459,459B) and 567-65.17(459,459B), the department ~~may~~ shall deny a construction permit, disapprove a manure management plan or prohibit construction of the proposed operation at the proposed location if the director determines from the evaluation conducted pursuant to this subrule that the operation would reasonably be expected to result in any of the following impacts:*

...

Amend 65.5(3)(c) by adding:

Criteria valuing environmental impacts shall account for animal agriculture's relationship to quality of the environment and the conservation of natural resources, and shall include factors that refer to all of the following:

a. Topography.

b. Surface water drainage characteristics.

c. The suitability of the soils and the hydrology and hydrogeology of the site.

d. The proximity to public use areas and critical public areas.

e. The proximity to water sources, including high-quality water resources and drinking water sources.

iii. *Adopt additional minimum requirements for the approval of new construction permits*

Amend section 65.5(3) as follows:

The department ~~may~~ shall evaluate any proposed confinement feeding operation or proposed expansion of a confinement feeding operation that requires a construction permit or manure management plan with respect to its potential adverse impacts on a natural resources or the environment.

a. In conducting the evaluation, the department shall consider the following factors:

...

(5) whether any water source in proximity to the proposed confinement feeding operation is impaired, whether there are any existing water quality improvement plans for proximate water sources, the proximity of the confinement feeding operation to drinking-water sources, and the number of existing animal feeding operations in proximity to the water sources for the location of the proposed construction or expansion of the confinement feeding operation.

b. In addition to the requirements in rules 567-65.9(459,459B), 567-65.10(459,459B), 567-65.11(459,459B) and 567-65.17(459,459B), the department ~~may~~ shall deny a construction permit, disapprove a manure management plan or prohibit construction of the proposed operation at the proposed location if the director determines from the evaluation conducted pursuant to this subrule that the operation would reasonably be expected to result in any of the following impacts: ...

Amend section 65.103(5) as follows:

The department ~~may~~ shall evaluate any proposed open feedlot operation or proposed expansion of an open feedlot operation that requires a construction permit with respect to its potential adverse impacts on natural resources or the environment. For the purpose of this subrule, open feedlot effluent includes manure, process wastewater, settled open feedlot effluent and settleable solids.

a. In conducting the evaluation, the department shall consider the following factors:

...

(5) whether any water source in proximity to the proposed open feedlot operation is impaired, whether there are any existing water quality improvement plans for proximate water sources, the proximity of the open feedlot operation to drinking water sources, and the number of existing animal feeding operations in proximity to the water sources for the location of the proposed construction or expansion of the open feedlot operation.

5. Description of Affected Class of Persons

All Iowans will be affected by the proposed rules because the rule change could improve water quality statewide. The ubiquity of CAFOs and threats associated with nitrogen and phosphorus pollution put all Iowans at risk. In addition, non-Iowans who are interested in or rely on Iowa's water resources will benefit from the cleaner water.

6. Request for a Meeting

Petitioners respectfully request a meeting with DNR regarding this petition as provided at 567 IAC 5.1 and the Uniform Rules on Agency Procedure.

7. Agency Consideration

The Uniform Rules on Agency Procedure provide that the agency must respond "within 60 days after the filing of the petition or within any longer period agreed to by the petitioner." Petitioners agree to a period of consideration for the petition of up to six months from the date of filing (with an additional extension of up to three months upon consent by petitioners). This extension will 1) ensure that DNR can adequately solicit public input and provide affected parties with a sufficient opportunity for input, 2) ensure that the state has enough time to conduct a fiscal/job impact

analysis, and 3) provide adequate time for permit derivation discussions.¹⁶

8. Inquiries

Communication regarding this petition should be directed to Michael R. Schmidt of the Iowa Environmental Council, Mailing Address: 505 5th Avenue, Suite 850, Des Moines, Iowa 50309. Email: schmidt@iaenvironment.org. Phone: 515-244-1194, extension 211.

9. Enclosures

Enclosure A: Brief in support of proposed rule making

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¹⁶ See Environmental Protection Commission, Denial of Petition for Rulemaking by Iowa Environmental Council and Environmental Law and Policy Center at 4-5 (October 14, 2013) (describing the need for public input before issuing notice of intent to adopt rules).

ATTACHMENT A

BRIEF IN SUPPORT OF PETITION FOR RULE MAKING TO REVISE RULES RELATING TO ANIMAL FEEDING OPERATIONS

I. BACKGROUND

Iowa is known for its agricultural production, including livestock and the crops they eat. Livestock in Iowa has become highly concentrated in animal feeding operations, with more than 12,000 active facilities identified by Iowa DNR. The manure produced by animals in animal feeding operations (AFOs) is far greater than the human waste in the state. It has contributed to the state's poor water quality and can only be remedied by amending the state's regulatory oversight.

A. CAFO Regulation in Iowa Is Lax.

The number of animal feeding operations in Iowa has grown significantly over the last 30 years. Most of the growth has been in the form of large concentrated animal feeding operations, primarily hog and hen confinements. Large AFOs with at least 1000 animal units and medium AFOs with at least 500 animal units (plus specifically designated AFOs) are known as *concentrated* animal feeding operations, or CAFOs.¹⁷ In 1990, Iowa had 789 large CAFOs.¹⁸ By 2019, the number of large CAFOs quintupled to 3,963,¹⁹ and it has continued to grow since then. The total number of animal feeding operations in the state is far larger, including 2,500 facilities that are slightly below the “large CAFO” threshold to avoid regulation, plus thousands of smaller operations.²⁰

The growth results from the lax oversight of CAFOs by the state. State law requires new large confinement operations to complete a “master matrix” scoring system, which overrides any local objection to the facility.²¹ A passing score will allow the confinement CAFO to be built. Open feedlots often need no permit at all, except perhaps for a manure lagoon, and are subject to different requirements from confinements.²² The legal distinction between confinements and open feedlots does not necessarily reflect the practices at the facilities, because “open feedlots” may be almost completely roofed and handle manure like a confinement operation.²³ Very few facilities – less than 2 percent – have obtained discharge permits under the Clean Water Act.²⁴ Manure

¹⁷ Iowa Admin. Code r. 567-65.100 (defining “concentrated animal feeding operation”).

¹⁸ Jamie Konopacky and Soren Rundquist, “EWG Study and Mapping Show Large CAFOs in Iowa Up Fivefold Since 1990,” Environmental Working Group, Jan. 21, 2020.

¹⁹ *Id.*

²⁰ IEC analysis of DNR AFO database, available at <https://programs.iowadnr.gov/animalfeedingoperations/>.

²¹ IOWA CODE § 459.305.

²² IOWA CODE § 459A.205; *see* § 459A.202 (requiring operating permits but repealed by its own terms per 2006 Acts, ch 1088, §2).

²³ *Cf.* IOWA CODE §§ 459.102 (defining “confined feeding operation” as being totally roofed); 459A.102 (defining “open feedlot operation” as an “unroofed or partially roofed animal feeding operation”).

²⁴ IOWA CODE § 459.311(2) (requiring compliance with the Clean Water Act requirements for permits); IEC analysis of DNR AFO database, available at <https://programs.iowadnr.gov/animalfeedingoperations/>.

management plans required for large facilities can be amended on-site without immediate submission to the DNR.²⁵ Documentation of compliance with manure management plans is not public.²⁶ The lack of regulatory oversight has encouraged the rapid growth described above.

New CAFOs can be built anywhere in the state, including in sensitive areas where the potential environmental consequences of a spill or failed manure containment system are greatest. The recent approval of a nutrient management plan for Supreme Beef LLC exemplifies this problem.²⁷

B. Unfettered CAFO Expansion Has Harmed Iowa's Water Quality.

Water quality in Iowa is poor and getting worse. CAFOs and Iowa's existing regulations (and lack thereof) play a significant role in the state's water quality problems.

The growth in the number and size of CAFOs led to an increase in the quantity of manure generated. Iowa now generates the manure equal to a population of 168 million people.²⁸ Most of this manure is not treated before being applied to cropland, where it can serve as fertilizer for crops. However, it can also run off fields in stormwater, or infiltrate the soil and pollute groundwater. The high volume of manure excreted in Iowa has led to areas of the state with manure application at rates that exceed crop needs.²⁹ This excess manure contains nitrate, phosphorus, and bacteria that can pollute Iowa waters when it is over-applied or improperly applied.³⁰

Nitrate concentrations in Iowa surface waters have been substantially increasing in recent years.³¹ The total load of nitrate leaving the state, measured as a five-year running average, has doubled in the last 17 years.³² Private wells across the state – located primarily in rural areas – have recorded high concentrations of nitrate and bacteria.³³

The Iowa DNR has listed or proposed to list hundreds of stream segments for impairments that may be caused by animal feeding operations:³⁴

²⁵ IOWA CODE § 459.312(3) (allowing annual updates to be submitted to the DNR).

²⁶ IOWA CODE § 459.312(12).

²⁷ See Erin Jordan, "Iowa DNR approves 11,600-head cattle feedlot near Monona," *The Gazette* (April 5, 2021), available at <https://www.thegazette.com/news/iowa-dnr-approves-11600-head-cattle-feedlot-near-monona/>.

²⁸ Chris Jones, "50 Shades of Brown," June 6, 2019, available at <https://www2.iuhr.uiowa.edu/cjones/50-shades-of-brown/>.

²⁹ Chris Jones, "Make America MRTN Again," June 21, 2019, available at <https://www2.iuhr.uiowa.edu/cjones/make-america-mrtn-again> (showing that manure produced in some Iowa counties meets or exceeds crop needs for phosphorus and nitrogen, despite continued sales of commercial fertilizer).

³⁰ Iowa Department of Agriculture and Land Stewardship, Iowa Department of Natural Resources, Iowa State University College of Agriculture and Life Sciences, *Iowa Nutrient Reduction Strategy* (rev. 2017), §2.1 at 4, 7-8.

³¹ Chris Jones, "Manure Matters: IA 2020 Nitrate Summary," Mar. 1, 2021, available at <https://www2.iuhr.uiowa.edu/cjones/manure-matters-ia-2020-nitrate-summary/>.

³² *Id.*

³³ Iowa Environmental Council and Environmental Working Group, "Iowa's Private Wells Contaminated by Nitrate and Bacteria," Apr. 2019, available at https://www.ewg.org/interactive-maps/2019_iowa_wells/.

³⁴ "2020 305(b) Assessment Summary," Iowa DNR, available at

- 429 stream segments for bacteria;
- 150 segments for biological uses;
- 96 for fish kills; and
- 22 for organic enrichment.

In addition, DNR has proposed to list numerous lakes for impairments that may be caused by animal feeding operations.³⁵

- 94 for algal growth;
- 32 for indicator bacteria; and
- 11 for organic enrichment.

Although DNR has not investigated the cause of most of these impairments, water quality improvement plans published by the DNR that analyze impairments have attributed pollution to livestock and called for changed practices.³⁶ DNR has also found that about 40 percent of fish kills are caused by animal waste.³⁷

C. Water Pollution Has Public Health and Economic Consequences.

Iowans face a barrage of pollutants in their drinking water, including nitrate, microcystins, and bacteria. These threats affect both public water supplies and private wells.

Nitrate in drinking water poses such serious human health threats that the Safe Drinking Water Act requires nitrate concentrations in public water supplies to stay below 10 mg/L.³⁸ Nitrate in drinking water can cause blue-baby syndrome, birth defects, bladder cancer, thyroid cancer, and other cancers.³⁹ But even concentrations below the Safe Drinking Water Act standard of 10 mg/L may cause a range of health problems, including cancer.⁴⁰

Nitrate has become a major concern for Iowa's drinking water utilities. The DNR has stated that the water supplies of 260 cities and towns are at risk from nitrate contamination.⁴¹ Community drinking water managers have publicly stated that installing nitrate treatment would be prohibitively expensive.⁴² Rural water utilities identified nitrate as a top concern for contamination

<https://programs.iowadnr.gov/adbnet/Assessments/Summary/2020>.

³⁵ *Id.*

³⁶ *See, e.g.*, "Water Quality Improvement Plan for Raccoon River, Iowa," Iowa DNR Watershed Improvement Section (2008), available at

<https://www.iowadnr.gov/portals/idnr/uploads/water/watershed/tmdl/files/final/raccoon08tmdl.pdf>.

³⁷ *Id.*

³⁸ 40 C.F.R. § 141.62.

³⁹ "Nitrate in Drinking Water: A Public Health Concern For All Iowans," Iowa Environmental Council (Sept. 2016), available at https://www.iaenvironment.org/webres/File/Nitrate_in_Drinking_Water_Report_ES_Web.pdf (citing Brender, Jean D; Weyer, Peter J; Romitti, Paul A; et al. 2013. Prenatal Nitrate Intake from Drinking Water and Selected Birth Defects in Offspring of Participants in the National Birth Defects Prevention Study. *Environmental Health Perspectives*, Vol. 121(9):1083-1089. <http://ehp.niehs.nih.gov/1206249/>).

⁴⁰ *Id.*

⁴¹ Donnelle Eller, "High nitrate levels plague 60 Iowa cities, data show," Des Moines Register (Jul. 4, 2015), available at <https://www.desmoinesregister.com/story/money/agriculture/2015/07/04/high-nitrates-iowa-cities/29720695/>.

⁴² Kate Payne, "Study: Nitrate Contamination in Water More Likely to Affect Lower Income Communities in

in a recent survey,⁴³ and the impacts of increased nitrate concentrations disproportionately affect lower-income communities.⁴⁴

Private wells in Iowa have widespread contamination above the standard for nitrate in public water supplies under the Safe Drinking Water Act. Based on thousands of tests, 12 percent of private wells exceeded 10 mg/L and more than 20 percent averaged at least 5 mg/L.⁴⁵ The average nitrate concentration in private wells in Iowa is 4.4 mg/L and has increased over time.⁴⁶ An analysis of Iowa wells found the distances to the nearest sinkhole and the nearest animal feeding operation were important variables for predicting well contamination.⁴⁷

The cost to remove nitrate and other pollutants from contaminated drinking water is enormous. Iowans may be responsible for up to hundreds of millions of dollars to remove nitrates from drinking water in the coming years.⁴⁸ The Des Moines Water Works spent millions of dollars to expand its nitrate removal facility and can have annual operating costs that exceed \$1 million.⁴⁹ Removing these nitrates through water treatment, rather than at the source of pollution, is costly for state and local agencies and unaffordable for some private well owners.⁵⁰

Additionally, manure runoff from CAFOs into local water sources can contain phosphorus pollution that promotes the growth of harmful algal blooms (HABs), which can cause illness in both animals and humans while limiting uses of surface water for drinking and recreation.⁵¹ HABs are comprised of cyanobacteria that can produce toxic microcystins. Exposure to microcystins in HABs has led to deaths of dogs and, in rare cases, humans.⁵² Microcystins can also cause serious

Iowa,” Iowa Public Radio (June 28, 2021), available at <https://www.iowapublicradio.org/ipr-news/2021-06-28/study-nitrate-contamination-in-water-more-likely-to-affect-lower-income-communities-in-iowa> (quoting a rural water system manager).

⁴³ Alicia Vasto and Silvia Secchi, “Rural Water Systems in Iowa: Analysis of Opportunities and Challenges,” Iowa Environmental Council (Feb. 2021), at 8, available at <https://www.iaenvironment.org/webres/File/Rural%20Water%20Systems%20in%20Iowa.pdf>.

⁴⁴ Anne Schechinger, “In Midwest farm states, nitrate pollution of tap water is more likely in lower-income communities,” EWG (June 23, 2021), available at <https://www.ewg.org/news-insights/news/midwest-farm-states-nitrate-pollution-tap-water-more-likely-lower-income>.

⁴⁵ Iowa Environmental Council and Environmental Working Group, “Iowa’s Private Wells Contaminated by Nitrate and Bacteria,” Apr. 2019, available at https://www.ewg.org/interactive-maps/2019_iowa_wells/.

⁴⁶ *Id.*

⁴⁷ Wheeler, D.C.; Nolan, B.T.; Flory, A.R.; et al. 2015. Modeling Groundwater Nitrate Concentrations in Private Wells in Iowa. In *Science of the Total Environment*, Vol. 536:481-488. <http://www.ncbi.nlm.nih.gov/pubmed/26232757>.

⁴⁸ “Rural Iowans Bear Brunt of Water Treatment Costs for Nitrate Pollution from Farms and CAFOs.” *Union of Concerned Scientists*, 14 Jan. 2021, www.ucsusa.org/about/news/rural-iowans-bear-brunt-water-treatment-costs-nitrate-pollution-farms-and-cafos.

⁴⁹ MacKenzie Elmer, “Water Works plans \$15 million for expanded nitrate facility,” *Des Moines Register* (May 25, 2015), available at <https://www.desmoinesregister.com/story/news/2017/05/25/water-works-plans-15-million-expanded-nitrate-facility/336648001/>.

⁵⁰ *Id.*

⁵¹ “Harmful Algal Blooms,” U.S. EPA, last visited August 9, 2021, available at <https://www.epa.gov/nutrientpollution/harmful-algal-blooms>.

⁵² *Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin*, U.S. EPA (May 2019) at 59-61, 64-68 (describing studies).

short-term and long-term illnesses including liver damage, neurotoxicity, gastrointestinal problems, and various flu-like reactions.⁵³ Beyond the human impacts, HABs can harm aquatic life.⁵⁴ Algae blooms can lower dissolved oxygen to a point that causes fish kills.⁵⁵ Cyanotoxins may accumulate in the muscles and internal organs of fish.⁵⁶

Des Moines Water Works has had to deal with increasing concentrations of microcystins in its source water, the Des Moines and Raccoon Rivers.⁵⁷ The agency recently reported that, for the first time ever, both the Des Moines and Raccoon River sources have exceeded the drinking water standard for microcystins.⁵⁸ Des Moines Water Works previously characterized the Des Moines River as “essentially unusable” for one-third of 2020 due to persistently high levels of microcystin.⁵⁹

Manure also contains fecal pathogens including *E. coli*, cryptosporidium, giardia, and viruses.⁶⁰ Even temporary exposure to these bacteria from recreation can cause gastrointestinal illnesses such as vomiting, nausea, and diarrhea.⁶¹ Public water supplies must eliminate essentially all of these pathogens, but private wells may not provide the same level of treatment. In Iowa, 22,000 of 55,000 private wells (40%) that tested for bacteria contained coliform or fecal coliform bacteria.⁶² A smaller number, approximately 4,300 wells, tested positive for bacteria every single time they were tested.⁶³ Thousands of Iowans are drinking water that can make them sick.

Pollution by nitrate, phosphorus, microcystins, and bacteria is especially harmful where the pollutants can most easily enter surface water or groundwater. These include areas of karst terrain, shallow groundwater, and surface drinking water sources. Iowa cannot afford to have these waters laden with nitrate, phosphorus, microcystins, and bacteria.

⁵³ *Id.*

⁵⁴ *Id.* at 109.

⁵⁵ See Iowa Department of Natural Resources, Methodology for Iowa’s 2018 Water Quality Assessment, Listing, and Reporting Pursuant to Sections 305(b) and 303(d) of the Federal Clean Water Act at 66 (Dec. 31, 2019), available at <http://publications.iowa.gov/31281/1/2018%20IA%20Methodology-Final.pdf>.

⁵⁶ *Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin*, U.S. EPA (May 2019) at 109.

⁵⁷ “Des Moines Water Works Detects Microcystin in Des Moines Water System,” Des Moines Water Works (Aug. 3, 2016), last visited July 9, 2021, available at <http://www.dmww.com/about-us/announcements/advisory.aspx>.

⁵⁸ Ted Corrigan, Des Moines Water Works CEO, “The Increasing Challenge of Producing Safe Drinking Water,” Iowa Learning Farms webinar (July 7, 2021), available at <https://www.iowalearningfarms.org/page/webinars>.

⁵⁹ Kate Payne, “Des Moines Water Works Advances Plans To Build New Wells In Light Of River Pollutants,” Iowa Public Radio (Apr. 22, 2021), available at <https://www.iowapublicradio.org/ipr-news/2021-04-22/des-moines-water-works-advances-plans-to-build-new-wells-in-light-of-river-pollutants>.

⁶⁰ “National Primary Drinking Water Regulations,” U.S. EPA (last updated Jan. 5, 2021), available at <https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations>.

⁶¹ “Recreational Water Quality Criteria,” U.S. EPA (2012), at 12, available at <https://www.epa.gov/sites/default/files/2015-10/documents/rwqc2012.pdf>.

⁶² Iowa Environmental Council and Environmental Working Group, “Iowa’s Private Wells Contaminated by Nitrate and Bacteria,” Apr. 2019, available at https://www.ewg.org/interactive-maps/2019_iowa_wells/.

⁶³ *Id.*

II. THE ENVIRONMENTAL PROTECTION COMMISSION HAS A DUTY TO ADOPT RULES THAT PROTECT AGAINST WATER POLLUTION FROM ANIMAL FEEDING OPERATIONS

The Environmental Protection Commission (EPC) is charged with adopting requirements regarding the construction of AFOs. Iowa Code section 459.103(1) states:

The commission shall establish by rule adopted pursuant to chapter 17A, requirements relating to the construction, including expansion, or operation of animal feeding operations, including related animal feeding operation structures. The requirements shall include but are not limited to minimum manure control, the issuance of permits, and departmental investigations, inspections, and testing.

This statute gives the EPC broad authority to regulate AFO siting and construction requirements.⁶⁴

The EPC is the only commission or department charged with adopting regulations to protect ambient water quality. It has broad statutory authority to “Develop comprehensive plans and programs for the prevention, control and abatement of water pollution.”⁶⁵ The EPC has adopted a range of rules addressing water quality, including regulations for AFOs. In adopting rules regulating AFOs, the EPC must ensure that “Manure from an animal feeding operation shall be disposed of in a manner which will not cause surface water or groundwater pollution.”⁶⁶

However, as described in the previous section, the existing regulations are failing to prevent, control, and abate water pollution. Manure is polluting Iowa’s waters. Water quality in Iowa is poor and is getting worse. Particularly for vulnerable locations, the EPC must take action to ensure that Iowans have access to safe, clean water.

III. EPC MUST REVISE RULES TO PROTECT KARST TOPOGRAPHY

One of the most pollution-sensitive features in Iowa is karst terrain, where surface water and groundwater interact. Additional nitrate and phosphorus in karst topography have a higher likelihood of degrading clean waters and harming their designated uses.

⁶⁴ See also IOWA CODE § 455B.173(12) (providing the EPC authority to “Adopt, modify, or repeal rules relating to the construction or operation of animal feeding operations, as provided in sections relating to animal feeding operations provided in chapter 459, subchapter III”).

⁶⁵ IOWA CODE § 455B.173.

⁶⁶ IOWA CODE § 459.311(3).

A. Karst Terrain

Karst is a landscape formation created by dissolving bedrock that may be comprised of sinkholes, sinking streams, caves, springs, and other features.⁶⁷ Karst is associated with soluble rock types such as limestone, marble, dolomite, and gypsum.⁶⁸ A typical karst landscape forms when much of the water falling on the surface interacts with and enters the subsurface through cracks, fractures, and holes that have been dissolved into the bedrock.⁶⁹

Karst is an ideal aquifer, but because it is porous, water travels quickly through it while receiving little filtration.⁷⁰ Therefore, contaminants that enter a karst aquifer are rapidly transported and create water quality problems.⁷¹ About 20% of the United States is underlain by karst landscapes and 40% of groundwater used for drinking comes from karst aquifers.⁷²

Most of the karst terrain in Iowa is in the northeast portion of the state, known as the Driftless area that was not subject to glaciation.⁷³ The porous rock is sometimes very close to the soil surface, reducing the potential for the soil to filter pollutants from water before it reaches an aquifer. Manure spills or other releases of pollutants on karst topography can quickly enter groundwater and pollute surface water. In July 2021, a leak from an underground storage system managed to cause a fish kill in surface water before the stream “disappeared underground just upstream of the Turkey River.”⁷⁴ A study of drinking water wells in fractured bedrock in Wisconsin found that livestock manure was the most likely source for contaminated drinking water that would result in gastrointestinal illness.⁷⁵

The majority of the waters that the Department of Natural Resources has designated as Outstanding Iowa Waters are in the area of karst terrain in Northeast Iowa.⁷⁶ The fact that these high-quality waters are located in karst terrain and are more vulnerable to pollution further necessitates preventing CAFO siting in these areas. The DNR’s recent approval of a large CAFO in the area led to widespread public outcry and poses a threat to multiple Outstanding Iowa Waters.⁷⁷

⁶⁷ NATIONAL PARK SERVICE, *Karst Landscapes*, <https://www.nps.gov/subjects/caves/karst-landscapes.htm> (last visited July 9, 2021).

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Id.*

⁷³ See “NE Iowa Watershed and Karst Map,” Iowa DNR (Nov. 2010), available at <https://www.iowadnr.gov/Portals/idnr/uploads/water/wells/IGWS%20Karst%20Map.pdf>.

⁷⁴ “DNR investigated fish kill in Winneshiek County over weekend,” Iowa DNR News Release, July 12, 2021.

⁷⁵ Coburn Dukehart, “Cow Manure Predicted To Cause Most Sickness From Contaminated Wells In Kewaunee County,” Wisconsin Public Radio (June 24, 2021) available at <https://www.wpr.org/cow-manure-predicted-cause-most-sickness-contaminated-wells-kewaunee-county>.

⁷⁶ See “Iowa’s Outstanding Iowa Waters Map,” Iowa DNR, available at https://www.iowadnr.gov/Portals/idnr/uploads/water/standards/outstanding_iowa_waters.pdf.

⁷⁷ See “Summary of Comments Received by the Iowa Department of Natural Resources,” Iowa DNR, April 2, 2021; Clay Masters, “The Battle Over Bloody Run Creek,” Iowa Public Radio (July 1, 2021), available at <https://www.iowapublicradio.org/environment/2021-07-01/the-battle-over-bloody-run-creek>.

B. Protections Necessary to Preserve Karst Terrain

Iowa Code prohibits unformed (i.e., earthen) CAFO manure structures above karst terrain.⁷⁸ Formed concrete structures are allowed with certain protections in place.⁷⁹ However, scholarship on karst shows that there is risk in building CAFOs on karst terrain even with those protections, and the rules must address that risk.⁸⁰ The rules should require greater vertical separation distance from karst terrain and existing recommendations in the rule should become requirements.⁸¹

All construction above karst is dangerous for water quality due to the potential for sinkholes and groundwater contamination.⁸² Because of this risk, experts have concluded it is safest to assess CAFO construction above karst on a site-by-site basis.⁸³ These experts also propose a more holistic process of handling construction above karst where scientists and farmers are more involved in the regulatory process.⁸⁴

Current rules require a five-foot separation from karst geology.⁸⁵ This is not adequate to ensure water will not be contaminated when manure structures are built in karst terrain, as required by statute.⁸⁶ This should be modified to require a 25-foot vertical separation, which is already in effect for unformed CAFO structures above karst.⁸⁷ Iowa rules contain an exception in chapter 567, section 65.15 for situations where the Natural Resources Conservation Service designs a structure that can be used for terrain less than 25 feet above karst based on the site-by-site data and external professional input.⁸⁸ That exception could remain in place to allow site-specific alternatives.

The proposed rule change would not prevent all CAFOs in karst terrain. Most karst terrain in Iowa is more than 25 feet below the surface, so this extension would not act as a blanket prohibition.⁸⁹ It would also allow more room for site-by-site approval of construction less than 25 feet above karst where conditions show risks are lower.

In addition, the rules should require that construction above less than five feet of karst, whether formed or unformed, is uniformly banned without exception. The EPC could accomplish this by

⁷⁸ IOWA CODE § 459.311.

⁷⁹ *Id.*; Iowa Admin. Code r. 567-65.15.

⁸⁰ See Van Brahana et al., *CAFOs on Karst—Meaningful Data Collection to Adequately Define Environmental Risk, with a Specific Application from the Southern Ozarks of Northern Arkansas*, US GEOL. SURVEY SCI. INVEST. REP. 5035, 97.

⁸¹ *See id.*

⁸² See Katarina Kopic et al., *Proposals for integrating karst aquifer evaluation methodologies into national environmental legislations*, 1 SUSTAIN. WATER RESOUR. MANAG. 373 (2015).

⁸³ *Id.*

⁸⁴ Katarina Kopic & Ira D. Sasowsky, *An interdisciplinary framework for the protection of karst aquifers*, 89 ENV. SCI. & POL'Y 41 (2018).

⁸⁵ Iowa Admin. Code r. 567-65.2(10)(b).

⁸⁶ Iowa Code § 459.311(3).

⁸⁷ Iowa Admin. Code r. 567-65.15.

⁸⁸ *Id.*

⁸⁹ David J. Weary & Daniel H. Doctor, *Karst in the United States: A digital map compilation and database*, USGS (2014), <https://pubs.usgs.gov/of/2014/1156/>.

turning the language of a recommendation in section 65.15 into a requirement.⁹⁰ This change would avoid the worst potential impacts in karst topography.

IV. EPC MUST REVISE RULES TO PROTECT DRINKING WATER SOURCES AND GROUNDWATER

A. General Protections

Iowa law currently imposes few protections to limit the siting of animal feeding operations in areas that pose a great risk to polluting Iowa’s drinking water sources.⁹¹ Allowing CAFOs to be placed in these high-risk areas results in pollution from nutrients such as nitrogen and phosphorus, pathogens such as *E. coli*, growth hormones, antibiotics, chemicals, and other pollutants connected to CAFOs.⁹²

To protect Iowa’s drinking water, the EPC must adopt rules requiring water pollution monitoring systems, the consideration of environmental factors in the DNR’s review process, and the adoption of additional minimum requirements for the approval of new construction. Doing so will protect Iowa’s waters and provide clearer requirements for owners and operators attempting to construct or expand a CAFO. This is consistent with the EPC’s legal obligation to “Develop comprehensive plans and programs for the prevention, control and abatement of water pollution.”⁹³ Moreover, clear requirements will provide greater transparency for the public in understanding how CAFOs are sited.

The construction, expansion, and location of CAFOs is at the discretion of the DNR and its director. As a result, 97 percent of requested CAFO permits are approved.⁹⁴ Providing clear guidelines and standard criteria in place of the Department’s near-total discretion will ensure that each proposed CAFO is carefully considered in a fair and equal manner in compliance with established requirements.

Additional direction in rule is necessary because Iowa’s lax CAFO laws and rules have created a serious public health problem by contaminating groundwater and surface water, including communities’ drinking water. The ongoing contamination of drinking water sources by nitrate, microcystins, and bacteria result in a wide range of health problems. Providing clean drinking water to Iowans must be a public health priority. The EPC must fulfill its duty to prevent these harms to Iowans.

⁹⁰ Iowa Admin. Code r. 567-65.15.

⁹¹ See generally Iowa Code 2021, Chapter 459 and Iowa Administrative Code 65.

⁹² Merchant, James, and David Osterberg. “The Explosion of CAFOs in Iowa and Its Impact on Water Quality and Public Health.” Iowa Policy Project, Jan. 2018, www.iowapolicyproject.org/2018docs/180125-CAFO.pdf.

⁹³ IOWA CODE § 455B.173.

⁹⁴ Merchant, James, and David Osterberg. “The Explosion of CAFOs in Iowa and Its Impact on Water Quality and Public Health.” Iowa Policy Project, Jan. 2018, www.iowapolicyproject.org/2018docs/180125-CAFO.pdf.

B. CAFO Rules Should Prevent and Abate Pollution.

To mitigate the public health risks and the immense costs of CAFO pollution to Iowa’s drinking water sources, the proposed rules in the petition to protect drinking water must be adopted. Each rule will help to minimize the potential for nitrate and other pollutants to enter water sources to begin with, which will save money and the health of Iowans.

The petition proposes to require water pollution monitoring for all confinements with unformed manure storage areas. Iowa Code expressly allows DNR to require water quality monitoring for unformed manure structures.⁹⁵ This monitoring is necessary to address the high frequency of nitrate contamination in private wells. As described above, the degree of contamination in private wells has increased over time, to the point that there are potential health risks for many Iowans. In addition, many Iowans who rely on private wells have not tested their wells for nitrate – they may not even know of the risk of contamination.⁹⁶ Because the Safe Drinking Water Act does not apply to private wells, it is especially important to prevent pollution of private wells at the source. Earthen manure containment systems have a potential to leach nitrate into groundwater⁹⁷ and should be responsible for ensuring that there is no downgradient contamination. This requirement is similar to requirements imposed in Wisconsin, which already requires monitoring around manure storage structures.⁹⁸

The second proposed change requires the DNR to evaluate environmental impacts in siting new AFOs. These considerations are necessary to ensure the regulatory structure for CAFOs appropriately prevents and abates pollution, fulfilling the EPC’s mandate in Iowa Code section 455B.173. Iowa Code expressly allows DNR to consider this in the master matrix.⁹⁹ Adopting the language as a requirement in rule is necessary to ensure AFOs do not cause undue environmental harm to drinking water sources or groundwater.

The third proposed change would require DNR to evaluate environmental factors in the permitting of new facilities. Like the other proposed revisions, this is necessary to fulfill the EPC’s duty to prevent and abate water pollution and to prevent disposal manure from causing water pollution.¹⁰⁰

Clear guidelines in the proposed rules will give feedlot operators notice of what is expected for construction and pollution mitigation. Setting standard criteria, such as those addressed in part *iii*. for the evaluation of the siting of CAFOs and feedlots, will not only make the process more transparent to the operators and public, but will immensely diminish the amount of polluted runoff entering water sources.

⁹⁵ IOWA CODE § 459.303(6).

⁹⁶ Iowa Environmental Council and Environmental Working Group, “Iowa’s Private Wells Contaminated by Nitrate and Bacteria,” Apr. 2019, available at https://www.ewg.org/interactive-maps/2019_iowa_wells/.

⁹⁷ Iowa Admin. Code r. 567-65.3(5)(a) (referencing actions to minimize leaching); *see, e.g.*, “Effects of Liquid Manure Storage Systems on Ground Water Quality,” Minnesota Pollution Control Agency (Apr. 2001), available at <https://www.pca.state.mn.us/sites/default/files/rpt-liquidmanurestorage.pdf> (finding increased nitrate and phosphorus downgradient of unlined and earthen basins).

⁹⁸ *Clean Wisconsin, Inc., v. Wisconsin Department of Natural Resources*, 2021 WI 71 (Case No.: 2016AP1688, decided July 8, 2021).

⁹⁹ IOWA CODE § 459.305(2).

¹⁰⁰ IOWA CODE §§ 455.173, 459.311(3).

All of the proposed rule changes to protect groundwater and drinking water sources are necessary to protect Iowa's water sources from contamination that will harm human health and impose severe economic costs.

V. **CONCLUSION**

The combination of lax regulations and rapid expansion of CAFOs in Iowa have led to significant water quality problems. The EPC must act to protect Iowa's sensitive landscapes, including areas of karst and drinking water sources. Failure to protect these resources will increase costs for Iowans and degrades the state's public resources. Adopting rules to increase separation distance from karst and protecting groundwater and drinking water sources will protect Iowans from CAFOs that pose the highest risk. Doing so will comply with the statute while reducing environmental harm and economic losses.

The Iowa Environmental Council and Environmental Law & Policy Center request EPC adopt the rules proposed in the petition to protect water quality across the state of Iowa.