

NORTH CAROLINA COURT OF APPEALS

ENVIRONMENTAL JUSTICE)
 COMMUNITY ACTION NETWORK)
 & CAPE FEAR RIVER WATCH,)
)
 Petitioners-Appellants,)
)
 v.)
)
 N.C. DEPARTMENT OF)
 ENVIRONMENTAL QUALITY,)
 DIVISION OF WATER RESOURCES,)
)
 Respondent-Appellee,)
)
 MURPHY-BROWN, LLC,)
)
 Respondent-Intervenor-Appellee.)
 _____)

From New Hanover County
22-CVS-443

AMICUS BRIEF OF ENVIRONMENTAL DEFENSE FUND

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Pursuant to Rule 28(i) of the North Carolina Rules of Appellate Procedure, the Environmental Defense Fund (“EDF”) respectfully submits this brief as amicus curiae in support of the Petitioner-Appellants in this matter.¹

BACKGROUND

As the number two pork-producing state in the nation, N.C. State Univ., *Swine*, <https://cals.ncsu.edu/are-extension/animal-agriculture/swine/> (last visited Jan. 30, 2023), North Carolina’s decades-long experience with hog production has generated private and public revenue, along with associated pollution, all which increased proportionally as hog operations increased in scale and number. Since the 1990s, the State’s hog industry has been dominated by these vertically integrated facilities, each capable of growing thousands of hogs in confined spaces, Owen J. Furuseth, *Hog Farming in Eastern North Carolina*, 41 *Southeastern Geographer* 53 (2001), and generating millions of gallons of wastes (feces, urine, and flushing water) that are flushed into open-air waste pits (“lagoons”). Mahmoud Sharara et al., *How Does Nitrogen Move Through a Swine Farm with a Lagoon-Sprayfield System?*, <https://content.ces.ncsu.edu/how-does-nitrogen-move-through-a-swine-farm-with-a-lagoon-sprayfield-system> (last visited Jan. 19, 2023).

Within the lagoons, waste separates into a bottom layer of solids covered by liquids, all of which contain organic matter that releases methane (CH₄)² during decomposition, as well as nutrients, phosphorous, and nitrogen. *Id.* Under normal conditions, the nitrogen that does not volatilize (that is, convert from a liquid or solid into a gas) before reaching the lagoon is converted to soluble ammonium (NH₄). Some ammonium in an open lagoon will volatilize into air pollutants

¹ No other person or entity other than EDF, its members, or its counsel directly or indirectly wrote this brief or contributed money for its preparation.

² Methane contributes to climate change as it is “more than 25 times as potent as carbon dioxide at trapping heat in the atmosphere,” EPA, *Importance of Methane*, <https://www.epa.gov/gmi/importance-methane> (last visited Jan. 30, 2023).

including ammonia (NH₃). *Id.* Improperly lined lagoons or overapplication of lagoon liquid on cropland can also result in seepage of nitrogen (as nitrate) into groundwater. Stephen L. Harden, *Surface Water Quality in Agricultural Watersheds of the North Carolina Coastal Plain Associated with Concentrated Animal Feeding Operations*, (2015), <https://pubs.usgs.gov/sir/2015/5080/pdf/sir2015-5080.pdf>. Additionally, waste lagoons on hog operations may fail, resulting in the discharge of thousands or even millions of gallons of wastes onto nearby land and into streams.³

As hog production evolved from small, non-integrated farming operations to the present-day facilities, the State acknowledged that traditional lagoon systems posed environmental and human health risks, and has taken steps to acknowledge and manage those risks, including administering a water quality permitting system for hog waste management facilities, N.C. Gen. Stat. §§ 143-215 *et seq.* Further, recognition of greenhouse gas methane emissions from lagoons spurred concern and innovation. Enclosed anaerobic digesters can play an important role in mitigating climate change by preventing methane emissions. However, enclosed anaerobic digesters for hog waste do not reduce waste generation and may increase other pollutants

³ N.C. Dep't of Env't Quality, Survey of Surface Water Quality Associated with Hurricane Matthew, October 2016 at 4 (May 5, 2017), <https://deq.nc.gov/media/8921/download>; N.C. Dep't of Env't Quality, State Environmental Inspectors to Test Water Quality Near Swine Farms (Oct. 19, 2016), <https://deq.nc.gov/news/press-releases/2016/10/19/state-environmental-inspectors-test-water-quality-near-swine-farms>; N.C. Dep't of Env't Quality, Notices of Deficiency Issued to DC Mill Farm # 52-13 (Feb. 20 & July 24, 2020), <https://www.documentcloud.org/documents/20441609-dc-mills-notices> (last visited Jan. 29, 2023) (documenting insufficient space between the top of the lagoon and stored liquids); N.C. Dep't of Env't Quality, Notice of Violation/Notice of Intent to Enforce to DC Mill Farm #52-13 (Jan. 6, 2021), <https://files.nc.gov/ncdeq/afo/DCMILLS-NOI-2021-Final-v1.0-Jan-2021--002-.docx.pdf> (regarding a spill resulting from a failed lagoon system); N.C. Dep't of Env't Quality, State Investigating the Release of Hog Waste from Lagoon in Bladen County (Jan. 28, 2023), <https://deq.nc.gov/news/press-releases/2023/01/28/state-investigating-release-hog-waste-lagoon-bladen-county> (investigation following a 30,000 gallon spill resulting from a recirculation pipe failure).

associated with hog operations. For example, recent research indicates that trapping ammonia creates wastes with up to 3.5 times greater nitrogen content, S.G. Lupis, *Best Management Practices for Reducing Ammonia Emissions: Lagoon Covers*, <https://extension.colostate.edu/topic-areas/agriculture/best-management-practices-for-reducing-ammonia-emissions-lagoon-covers-1-631b/> (last visited Jan. 30, 2023), which increases the severity of nutrient and air pollution. Anaerobic digesters have not been demonstrated to sufficiently control for odor or other local health impacts from hog operations, such as increased rates of asthma. *V. Blanes-Vidal et al., Characterization of Odor Released During Handling of Swine Slurry: Part I. Relationship between Odorants and Perceived Odor Concentrations*, 43 *Atmospheric Env't* 18 (2009).

For these reasons and the reasons explained below, this Court should give force to North Carolina's statutory provision requiring that the least adversely-impactful, practicable alternative technology be implemented, N.C. Gen. Stat. § 143-215.1(b)(2), and recognize that implementing this provision is not an exercise in futility—viable, less polluting alternatives are available and, in accordance with state law, must be considered by Respondent-Appellee during the permitting process.

NATURE OF AMICUS CURIAE'S INTERESTS

EDF is a national, membership-based environmental 501(c)(3) nonprofit organization with a longstanding presence in North Carolina. Over the past fifty years, EDF has prioritized fact-based scientific research, economic analysis, and collaboration with industry, nonprofit, and community leaders to address the root causes of and solutions to environmental issues including climate change, transitioning to renewable energies, and sustainable agriculture. Since the mid-1990s, EDF has worked with stakeholders, including Murphy-Brown's parent company, in an effort to find and implement alternative hog waste management technologies. *E.g.*, EDF,

Environmental Defense, Frontline Farmers to Develop Plan for Cleaner Hog Farming (March 9, 2006), <https://www.edf.org/news/environmental-defense-frontline-farmers-develop-plan-cleaner-hog-farming>. As research and technology has evolved, EDF has refined its position on the appropriate application of biogas technology and the importance of addressing impacts to local communities.

Unfortunately, Respondent-Intervenor-Appellee Murphy-Brown (“Murphy-Brown”) has carefully selected portions of EDF’s past statements, misrepresenting the intent of these statements. EDF now submits this brief to correct the record and offer additional information and perspective supporting the Petitioner-Appellants’ arguments on the legal issues presented in this matter.

ARGUMENT

I. Clarification Regarding EDF’s Past Statements Cited by Murphy-Brown, Current Position, and Mission.

With respect to hog-generated biogas deployment in North Carolina, EDF previously applauded industry commitments to invest in biogas technology to reduce methane pollution as an important step towards securing a climate-safe future for our planet. EDF also stated clearly that biogas investments alone do not sufficiently address a broader set of local environmental and public health impacts associated with factory hog operations, and that additional action is essential to solve these critical community concerns.

Unfortunately, and without EDF’s knowledge, Murphy-Brown has used EDF’s past statements in a manner seemingly intended to weaken Petitioner-Appellants’ arguments in this case. (R pp 637, 758) The cited language omits specific references regarding the need to address specific hog waste pollutants and local health impacts. The October 25, 2018 statement cited by Murphy-Brown, *id.*, made explicit that biogas digesters are a partial solution:

Covers and digesters do not eliminate water quality and odor concerns near hog farms. EDF will continue to collaborate with Smithfield and other partners to close operations in high-risk floodplains and implement solutions that improve quality of life and environmental outcomes.

EDF, *Smithfield Addresses the Hog Industry's Vulnerability to Climate Change: EDF Welcomes New Measures to Improve Resilience, Reduce Methane Emissions* (Oct. 25, 2018), <https://www.edf.org/media/smithfield-addresses-hog-industrys-vulnerability-climate-change>.

In a longer blog published the next day, EDF again highlighted the human health risks and air and water pollution unaddressed by the installation of enclosed aerobic digesters:

For example, open lagoons emit ammonia nitrogen gas, which can contribute to water pollution and human health impacts such as asthma. Covers prevent nitrogen from escaping into the air, but they keep nitrogen in liquid form, which presents other advantages and challenges.... These potential trade-offs must be analyzed to ensure that the net result is improved water quality.

EDF, *How One Company's Sustainability Goal Is Poised to Change an Entire Industry* (Oct. 26, 2018), <https://blogs.edf.org/growingreturns/2018/10/26/smithfield-manure-climate-resilience/>.

Two months later, EDF again emphasized the partial nature of methane biogas digesters:

“[B]iogas technology won't address the total environmental impact of manure – most notably, water quality and odor concerns of nearby communities. But this investment provides a foundation for additional management changes or technologies that can also address those challenges.

EDF, *How One Company's Plan to Turn Pollution into a Commodity Could Change an Entire Industry* (Dec. 12, 2018), <https://www.edf.org/blog/2018/12/12/how-one-companys-plan-turn-pollution-commodity-could-change-entire-industry>.

Murphy-Brown's selective citations ignore the broader context in which EDF made the quoted statements, and would lead the reader to believe that EDF entirely agrees with Murphy-Brown's position in this case. That is not accurate. To be clear, EDF is committed to supporting communities and individuals who have long suffered a disproportionate burden from the pollution and public health impacts associated with hog farm operations in North Carolina. EDF has always

recognized that digesters are not a full solution for all air and water quality concerns from large farms. EDF stands firm in our obligation to secure critical change necessary to ensure a healthy, just and economically prosperous future for all of North Carolina's communities.

For over twenty-five years, EDF has been involved in the investigation of, and advocacy for the treatment of hog manure using methods with the least effect on the environment. Throughout this work, EDF has pursued and facilitated research and advocacy for improving hog waste management, always advocating for options that reduce pollutant emissions, such as the ammonia and odors that emanate from open lagoon and spray field systems, in addition to climate warming methane emissions.

In November and December of 2021, EDF participated in a series of stakeholder meetings and public commenting efforts related to the State's then-proposed general permit for anaerobic digesters, as required by the 2021 Farm Act. N.C. Sess. Law 2021-78 (2021). Via written and verbal comments, EDF stressed the well-documented public health risk associated with hog-generated ammonia emissions and the need for monitoring to understand how anaerobic digester installations would change and potentially increase ammonia emissions from the hog waste treatment systems. EDF also highlighted that the effluent from the anaerobic digesters when stored in open lagoons ("secondary lagoons") could result in high levels of nitrous oxide emissions, a potent greenhouse gas with approximately 250 times the global warming potential of carbon dioxide. NOAA Global Monitoring Laboratory, *Annual Greenhouse Gas Index (AGGI)*, <https://gml.noaa.gov/aggi/aggi.html> (last visited Feb. 1, 2023).

II. A Rational Reading and Interpretation of North Carolina’s General Statutes Confirms that the Alternatives Requirements Apply to Respondent-Intervenor-Appellees’ Facilities.

In relevant part, North Carolina General Statutes Chapter 143, Article 21, Part 1 (“Part 1”)⁴ establishes DWR’s general authorities, when a person must obtain a permit before engaging in activities that emit water and air pollution, and DWR’s mandatory duties when issuing permits for the circumstances enumerated in N.C. Gen. Stat. § 143-215.1(a). N.C. Gen. Stat. §§ 143-211 to -215.10. This Part provides the overarching structure and baseline requirements for DWR to issue and an applicant to receive such permits. Section 143-215.1(a)(12) specifies that constructing or operating an “animal waste management system”⁵ requires a permit under either Part 1 or Part 1A of Article 21.

Part 1 further mandates that DWR:

shall also act on *all permits* so as to prevent violation of water quality standards due to the cumulative effects of permit decisions. Cumulative effects are impacts attributable to the collective effects of a number of projects and include the effects of additional projects similar to the requested permit in areas available for development in the vicinity. All permit decisions *shall* require that the practicable waste treatment and disposal alternative with the least adverse impact on the environment be utilized.

Id. § 143-215.1(b)(2) (emphasis added). Logically, “all permits” refers back to N.C. Gen. Stat. § 143-215.1(a), which explicitly encompasses permits issued under both Parts 1 and 1A of Article 21. This also must be the case because “the effects of additional projects similar to the requested permit” necessarily include those animal waste management system projects authorized under either Part. A contrary interpretation would result in allowing DWR to ignore

⁴ Although the cited statutory provisions refer to the North Carolina Environmental Management Commission as the permit-letting entity, in practice it is Respondent-Appellee DWR that issues the permits required under Part 1.

⁵ N.C. Gen. Stat. § 143-215.10B in Part 1A defines “animal waste management system” as “a combination of structures and nonstructural practices serving a feedlot that provide for the collection, treatment, storage, or land application of animal waste.”

its mandate to only authorize the least impactful alternative, and therefore ignore the General Assembly’s clear directive to minimize the cumulative effects of permitted activities—an absurd result that would undermine this provision to a point of rendering it a nullity. *Romulus v. Romulus*, 216 N.C. App. 28, 34, 715 S.E.2d 889, 893 (2011) (citation omitted) (“It is well settled that in construing statutes courts normally adopt an interpretation which will avoid absurd or bizarre consequences, the presumption being that the legislature acted in accordance with reason and common sense and did not intend untoward results. Accordingly, an unnecessary implication arising from one statutory section, inconsistent with the *express terms* of another on the same subject, yields to the expressed intent.”) (emphasis added).

Part 1A provides additional, non-conflicting, details regarding the permitting programs for animal waste management systems, which vary in operation based upon the animal species being raised, as well as additional departmental duties to implement Article 21. N.C. Gen. Stat. §§ 143-215.10A to 215.10M. It notably does not exempt DWR from considering cumulative impacts and requiring the least impactful alternative when issuing permits for specific types of animal waste management systems.

Only when a statute’s language is ambiguous and an actual conflict between statutory terms exists is it appropriate to apply the canons of statutory construction. *JVC Enterprises, LLC v. City of Concord*, 376 N.C. 782, 786, 855 S.E.2d 158, 161 (2021) (citation omitted); *see State v. Essick*, 282 N.C. App. 150, 869 S.E.2d 787 (2002) (“In the instant case, however, we are not presented with a conflict between two statutory provisions—one general and one specific—which the traditional rules of statutory interpretation would guide us to resolve by favoring the specific provision as an exception to the general.”). Otherwise, a reviewing court must give effect to all parts of a statute as written:

The “cardinal principle” of statutory construction is “to give effect to the legislative intent.” . . . “Where the statutory language is clear and unambiguous, the Court does not engage in judicial construction but must apply the statute to give effect to the plain and definite meaning of the language.” When engaging in judicial construction, this Court ascertains legislative intent by considering “the purpose of the statute and the evils it was designed to remedy, the effect of proposed interpretations of the statute, and the traditionally accepted rules of statutory construction.”

FMSH L.L.C. v. N.C. Dep't of Health & Hum. Servs., 279 N.C. App. 157, 163, 865 S.E.2d 666, 670 (2021) (citations omitted).

Further, courts do not owe an implementing agency deference when a statute is clear and unambiguous. *High Rock Lake Partners, LLC v. N.C. Dep't of Transp.*, 366 N.C. 315, 319, 735 S.E.2d 300, 303 (2012) (“[T]he responsibility for determining the limits of statutory grants of authority to an administrative agency is a judicial function for the courts to perform . . . “[u]nder no circumstances will the courts follow an administrative interpretation in direct conflict with the clear intent and purpose of the act under consideration.”) (citations and original quotation marks omitted). As indicated above, Part 1 and Part 1A’s language functions as a clear, cohesive whole that establishes a permitting system designed to avoid more than minimal environmental impacts. DWR’s suggestion that this Court ignore Part 1’s cumulative impacts provision, but not other provisions within Part 1, is contrary to the overall statutory scheme and the General Assembly’s intent evident from the statute as enacted, the ultimate expression of legislative intent, and should not be adopted by this Court.

III. Practicable Waste Treatment and Disposal Alternatives that Result in Fewer Adverse Environmental Impacts Exist and Have Been Employed by Murphy-Brown’s Parent Company.

Through EDF’s long history of studying alternative hog waste technologies, it is aware that biogas digester technologies exist and are in use that capture prevalent pollutants, including ammonia, odors, and methane. For example, under a 2001 EPA Consent Decree, Smithfield’s

Missouri operations are required to install manure treatment technologies which would result in “substantial elimination” of ammonia and hydrogen sulfide emissions, beyond what is required or achieved under the contested individual permits. *Citizens Legal Env’t Action Network v. Premium Standard Farms*, Consent Decree, 97-6073-CV-SJ-6, 98-6099-CV-W-6 (W.D.M.O. 2001), <https://www.epa.gov/sites/default/files/documents/psfcd.pdf>.

The Consent Decree also requires that nitrogen concentrations be reduced by 50% before land application. The technology selected to achieve these treatment requirements employs a combination of microbial processes known as nitrification and denitrification. *Id.* In these processes, ammonia is first converted to nitrate by aerating the waste stream (nitrification), followed by an anoxic treatment step where aeration is ceased and nitrate is converted to N₂, a benign gas making up nearly 80% of the atmosphere (denitrification). The Consent Decree further requires any anaerobic lagoons to be covered with a permeable cover designed to reduce odor, ammonia, and hydrogen sulfide emissions. *Id.*

In this example, Smithfield has modified the current treatment system beyond the Consent Decree’s requirements, and now uses scrapers to move manure from the barns and into anaerobic digesters with impermeable covers which capture biogas. This biogas then is processed and injected into natural gas pipelines, similar to the process in North Carolina. The digestate is still treated with a nitrification/denitrification process to reduce ammonia and hydrogen sulfide emissions, and to reduce the concentration of land-applied nitrogen.⁶

⁶ Joint venture Monarch Bioenergy, which includes Smithfield Foods, Roeslein Alternative Energy, and TPG Rise Climate, handle manure treatment. Roeslein Alternative Energy, LLC, *How RAE Helped Smithfield Save the Worst Hog Farm in America*, <https://roesleinalternativeenergy.com/how-rae-helped-smithfield-save-the-worst-hog-farm-in-america/> (last visited Feb. 2, 2023).

Additional alternative technologies for anaerobic digester effluent that treat hog waste pollutants are available. Nitrification/denitrification treatment systems are widely used in municipal wastewater treatment plants and other industrial waste treatment systems, and have been modified to accommodate hog waste facilities' needs.

Other pH-based technologies capture and process ammonia to produce a concentrated ammonia product that can be used as a crop fertilizer or as a chemical reagent in industrial processes. *See, e.g.,* Quan-Bao Zhao et al., *Ammonia Recovery from Anaerobic Digester Effluent through Direct Aeration*, 279 Chem. Eng'g J. 31 (2015). Recent modifications of this treatment approach use permeable membrane tubes circulating acidic fluids, which are placed in high ammonia concentration segments of the treatment system resulting in ammonium diffusing cross the permeable membrane into the acidic solution where it can be concentrated and used as a fertilizer or for other uses.⁷

These examples illustrate the availability of practicable alternatives that give North Carolina's hog waste producers practicable ways to handle wastes with fewer adverse environmental effects.

CONCLUSION

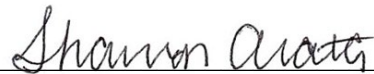
This Court is in the position to effectuate the General Statutes' alternatives provision by following the statute's plain language and requiring the Respondent-Appellee to authorize the least

⁷ *See, e.g.,* M.C. Garcia-Gonzalez & M.B. Vanotti, *Recovery of Ammonia from Swine Manure Using Gas-Permeable Membranes: Effect of Waste Strength and pH*, 38 Waste Mgmt. 455 (2015); Melanie Fillingham et al., *Characterizing the Performance of Gas-Permeable Membranes as an Ammonia Recovery Strategy from Anaerobically Digested Dairy Manure*, 7 Membranes 59 (2017); María Soto-Herranz et al., *Evaluation of Different Capture Solutions for Ammonia Recovery in Suspended Gas Permeable Membrane Systems*, 12 Membranes 572 (2022).

adversely-impactful alternative in issuing swine waste management system permits. Assessing alternatives is not a theoretical exercise; alternative technologies are available and have been employed by Murphy-Brown's parent company in other states. For the foregoing reasons, amicus respectfully recommends that this Court to grant Petitioner-Appellants' requested relief and hold that N.C. Gen. Stat. § 143-215.1(b)(2) applies to the contested permits.

Respectfully submitted this the 2nd day of February, 2023.

CALHOUN, BHELLA & SECHREST,
LLP

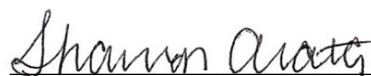


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CERTIFICATE OF COMPLIANCE

Pursuant to Rule 28(j) of the North Carolina Rules of Appellate Procedure, undersigned counsel certifies that the foregoing brief, which was prepared using 12-point proportionally spaced font with serifs, is less than 3,750 words (excluding covers, captions, indices, tables of authorities, counsel's signature block, certificates of service, and this certificate of compliance) as reported by the word processing software used to prepare this brief (Microsoft Word).

This the 2nd day of February 2023.



Shannon Arata

Attorney for Environmental Defense Fund

CERTIFICATE OF SERVICE

The undersigned, on behalf of the Environmental Defense Fund, certifies that the foregoing AMICUS BRIEF has been served on all counsel in this action via electronic mail and U.S. mail as follows:

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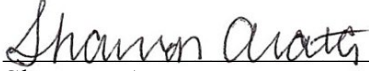
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