

ORAL ARGUMENT NOT YET SCHEDULED
No. 25-5354

IN THE
**United States Court of Appeals for the
District of Columbia Circuit**

RURAL EMPOWERMENT ASSOCIATION FOR COMMUNITY HELP, *et al.*,
Plaintiffs-Appellants,

— v. —

U.S. ENVIRONMENTAL PROTECTION AGENCY, *et al.*,
Defendants-Appellees,

and

NATIONAL CATTLEMEN’S BEEF ASSOCIATION, *et al.*,
Intervenors-Appellees.

**On Appeal from the United States District Court for the District
of Columbia in Case No. 18-cv-2260, Hon. Timothy J. Kelly**

***AMICUS CURIAE* BRIEF OF AMERICAN LUNG ASSOCIATION AND
MEDICAL SOCIETY CONSORTIUM ON CLIMATE AND HEALTH IN
SUPPORT OF PLAINTIFFS-APPELLANTS**

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**CERTIFICATE AS TO PARTIES, RULINGS, AND RELATED CASES,
AND RULE 26.1 DISCLOSURE**

Pursuant to D.C. Circuit Rule 28(a)(1) and Federal Rule of Appellate Procedure 26.1, counsel for *amici curiae* American Lung Association and Medical Society Consortium on Climate and Health certify as follows:

(A) Parties and Amici.

Except for the amici joining this brief and any other amici who had not yet entered an appearance in this case as of the filing of this brief, all parties, intervenors, and amici appearing before the district court and this Court are listed in Brief for Appellants.

(B) Rulings Under Review.

References to the ruling at issue appear in the Brief for Appellants.

(C) Related Cases.

Amici are unaware of any related cases pending before this Court or any other court.

(D) Rule 26.1 Disclosure

Pursuant to Federal Rule of Appellate Procedure 26.1 and D.C. Circuit Rule 26.1, *amici curiae* state that no party to this brief is a publicly held corporation, issues stock, or has a parent corporation.

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GLOSSARY

Pursuant to Circuit Rule 28(a)(3), the following is a glossary of acronyms and abbreviations used in this brief:

AFOs	Animal Feeding Operations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPCRA	Emergency Planning and Community Right-to-Know Act
H ₂ S	Hydrogen Sulfide
LEPC	Local Emergency Planning Committee
NH ₃	Ammonia
PM _{2.5}	Fine Particulate Matter
SERC	State Emergency Planning Commission
TRI	Toxic Release Inventory
2008 Rule	CERCLA/EPCRA Administrative Reporting Exemption for Air Releases of Hazardous Substances from Animal Waste at Farms, 73 Fed. Reg. 76948 (Dec. 18, 2008)
2019 Rule	Amendment to Emergency Release Notification Regulations on Reporting Exemption for Air Emissions from Animal Waste at Farms; Emergency Planning and Community Right-to Know Act, 84 Fed. Reg. 27533 (June 13, 2019)

STATEMENT OF AUTHORSHIP AND FINANCIAL CONTRIBUTIONS

Pursuant to Fed. R. App. P. 29(a)(4)(E), Amici Curiae state that no counsel for any party authored this brief in whole or in part, and that no person or entity, other than Amici and their counsel, made a monetary contribution intended to fund the preparation and submission of this brief.

STATEMENT OF IDENTITY AND INTEREST OF AMICI CURIAE

The American Lung Association is a nationwide organization dedicated to saving lives by improving lung health and preventing lung disease. It has extensive expertise on the health consequences of air pollution. Given this work, the American Lung Association has a strong interest in ensuring that emissions of harmful chemicals are reported so that people can protect themselves, advocate for community well-being, and ensure that emergencies are addressed in ways that best protect health and save lives.

The Medical Society Consortium on Climate and Health is a coalition of major medical societies, state-level climate and health groups, and trained physician leaders. Its members have firsthand experience with the harmful health effects of air pollution through the patients they treat. The Consortium focuses on raising public awareness about these harms and therefore has a strong interest in this case, as adequate and accurate reporting is central to these educational efforts.

Amici filed a Motion for Leave to File this Brief contemporaneously with this brief on April 14, 2026.

SUMMARY OF ARGUMENT

This brief is submitted by organizations representing public health and medical professionals to bring to the Court’s attention the significant literature documenting the suite of harms associated with releases of ammonia and hydrogen sulfide from animal waste at Animal Feeding Operations (AFOs), and the important role that emergency notifications pursuant to section 304 of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), 42 U.S.C. 11004(a)(2)(C), play in facilitating emergency response and informing the public about hazardous releases. *Amici* respectfully submit this brief and Annotated Partial Bibliography of Peer-Reviewed Literature¹ in support of Appellants’ challenge to EPA’s 2019 Rule exempting animal waste air emissions from EPCRA emergency reporting requirements² and incorporate their arguments by reference.

¹ Annotated Partial Bibliography of Peer-Reviewed Literature, Appendix A.

² Amendment to Emergency Release Notification Regulations on Reporting Exemption for Air Emissions from Animal Waste at Farms; Emergency Planning and Community Right-to-Know Act, 84 Fed. Reg. 27533 (June 13, 2019) (the “2019 Rule”) (codified at 40 C.F.R. § 355.31 (2026)).

ARGUMENT

I. WELL-ESTABLISHED SCIENTIFIC EVIDENCE DEMONSTRATES THAT AIR EMISSIONS FROM AFOS HAVE ADVERSE HEALTH EFFECTS

A. The Off-Site Migration of AFO Emissions Causes Serious Harm to the Neurological, Respiratory, and Cardiovascular Health of Neighboring Communities, and Significantly Degrades Quality of Life

Extremely hazardous substances generated by AFOs do not remain within facility boundaries. Hydrogen sulfide (H₂S) and ammonia (NH₃) emissions from AFOs migrate significant distances, exposing nearby residents, schoolchildren, and other community members to dangerous concentrations of harmful emissions.³ The off-site transport of H₂S or NH₃ in emergency circumstances, which is relevant to the instant case, poses both acute and chronic risks to human health.

Exposure to even low levels of H₂S, a byproduct of decomposing animal waste, is associated with measurable neurological and respiratory injury.⁴ H₂S and

³ See, e.g., Yelena Ogneva-Himmelberger et al., *CALPUFF and CAFOS: Air Pollution Modeling and Environmental Justice Analysis in the North Carolina Hog Industry*, Geo-Info. 150, 161 (2015); Patrick T. O’Shaughnessy & Ralph Altmaier, *Use of AERMOD to Determine a Hydrogen Sulfide Emission Factor for Swine Operations by Inverse Modeling*, 45 Atmospheric Env’t 4617, 4617 (2011). See also Appendix A, Bibliography, for an annotated partial bibliography of literature concerning off-site migration of emissions from AFOs and harms associated with exposure to hydrogen sulfide and ammonia emissions from AFOs not referenced in the text of this brief.

⁴ See, e.g., Stuart Batterman et al., *Low Level Exposure to Hydrogen Sulfide: A*

associated odor have also been linked to acute blood pressure increases in neighboring residents, which is associated with chronic disease, such as hypertension.⁵

NH₃ emissions compound these harms. Among children with asthma, each incremental increase in NH₃ exposure has been associated with declines in lung function.⁶ Moreover, agricultural NH₃ contributes to the formation of fine particulate matter (PM_{2.5}), which is associated with chronic obstructive pulmonary disease, lung cancer, and premature death.⁷

The scientific literature makes clear that infants, children, and adolescents are particularly impacted by AFO emissions. Children and adolescents living near AFOs experience higher risks of asthma symptoms and measurably reduced lung function.⁸ Agricultural NH₃ emissions have been associated with reduced lung

Review of Emissions, Community Exposure, Health Effects, and Exposure Guidelines, 53 *Critical Rev. Toxicology* 244, 244 (2023); Kaye H. Kilburn, *Human Impairment from Living near Confined Animal (Hog) Feeding Operations*, 2012 *J. Env't & Pub. Health* 565690, 1 (2012).

⁵ Steve Wing et al., *Air Pollution from Industrial Swine Operations and Blood Pressure of Neighboring Residents*, 121 *Env't Health Persp.* 92, 92 (2013).

⁶ Christine Loftus et al., *Ambient Ammonia Exposures in an Agricultural Community and Pediatric Asthma Morbidity*, 26 *Epidemiology* 794, 794 (2015).

⁷ Katie E. Wyer et al., *Ammonia Emissions from Agriculture and Their Contribution to Fine Particulate Matter: A Review of Implications for Human Health*, 323 *J. Env't Mgmt.* 116285, 1 (2022).

⁸ See, e.g., Julia R. Barrett, *Hogging the Air: CAFO Emissions Reach into Schools*, 114 *Env't Health Persp.* A241, A241 (2006); Pauline Kiss et al., *Residential Exposure to Livestock Farms and Lung Function in Adolescence – The PIAMA Birth Cohort Study*, 219 *Env't Rsch.* 115134 (2023) (“Results”).

function and “may directly influence the early on-set of asthma in young children.”⁹

Proximity to AFOs has also been associated with increased perinatal disorders, spontaneous abortion, and infant mortality due to respiratory disease.¹⁰ The evidence thus establishes that AFO emissions imperil some of the most vulnerable members of affected communities at the earliest and most consequential stages of their development.

More broadly, AFO emissions and their associated odors impose significant psychological and quality-of-life burdens on surrounding communities. Residents within 1.5 miles of industrial hog operations reported elevated stress and negative mood states directly correlated with H₂S concentrations and associated odor.¹¹

AFO odor further restricts residents’ ability to engage in ordinary daily activities—including outdoor recreation, socializing, relaxing, and sleeping—with cascading consequences for long-term health and well-being.¹²

⁹ Wyer et al., *supra* note 7, at 116285.

¹⁰ Stacy Sneeringer, *Does Animal Feeding Operation Pollution Hurt Public Health? A National Longitudinal Study of Health Externalities Identified by Geographic Shifts in Livestock Production*, 91 Am. J. Agric. Econ. 124, 126, 135 (2009).

¹¹ Rachel Avery Horton et al., *Malodor as a Trigger of Stress and Negative Mood in Neighbors of Industrial Hog Operations*, 99 Am. J. Pub. Health Suppl. S610, S613 (2009).

¹² M. Tajik et al., *Impact of Odor from Industrial Hog Operations on Daily Living Activities*, 18 New Solutions 193, 198–202 (2008).

B. Exposure to Air Pollutants from AFO Compounds Cumulative Impacts in Communities at Higher Risk

The impacts of emissions from AFOs can have even greater effects on environmentally overburdened communities and populations with pre-existing health conditions. A 2025 spatial analysis found geographic concentration of cattle and hog AFOs and a disproportionate burden on at-risk populations with limited health insurance coverage for adverse health outcomes.¹³ At the state level, several studies have similarly noted a disproportionate concentration of AFOs near low-income communities and communities of color.¹⁴ In rural communities, health outcomes from AFO emissions can compound other health determinants, including access to high quality, timely health care.

II. SECTION 304 REPORTING FACILITATES LOCAL EMERGENCY PLANNING AND RESPONSE AND PROVIDES LOCAL COMMUNITIES WITH ESSENTIAL INFORMATION, ADVANCING EPCRA'S UNIQUE DUAL PURPOSE

EPCRA's Section 304 emergency notification requirement, 42 U.S.C.

11004(a)(2)(C), ("emergency notification" or "304 reporting") plays a critical role in fulfilling EPCRA's dual purpose of facilitating local emergency planning and

¹³ Sanaz Chamanara et al., *Geography of Animal Feeding Operations and Their Contribution to Fine Particulate Matter Pollution in Vulnerable Communities in the United States*, 6 *Comm'n Earth & Env't* 620 (2025) ("Results").

¹⁴ Jonathan Hall et al., *Environmental Injustice and Industrial Chicken Farming in Maryland*, 18 *Int'l J. Env't Rsch. & Pub. Health* 11039 (2021) ("Results"); Ji-Young Son et al., *Distribution of Environmental Justice Metrics for Exposure to CAFOs in North Carolina, USA*, 195 *Env't Rsch.* 110862 (2021) ("Results").

response and informing community members about chemical hazards.¹⁵ By exempting emissions from AFOs from this reporting requirement, the EPA undermines EPCRA’s purpose, impedes local agencies from carrying out safe and effective emergency responses, and directly threatens the health of all visitors and residents who may be exposed to releases of animal waste from AFOs.

The EPA has classified H₂S and NH₃ as extremely hazardous substances, requiring notification for releases above 100 pounds in a twenty-four-hour period.¹⁶ Pursuant to Section 304 and EPA regulations,¹⁷ when a covered facility emits a reportable quantity of an extremely hazardous substance, the owner or operator of the facility must immediately notify the emergency coordinator for their Local Emergency Planning Committee (LEPC) or relevant local emergency response personnel and their State Emergency Response Commission (SERC), about the release and provide them with relevant information.¹⁸ This information

¹⁵ See *Steel Co. v. Citizens for a Better Env’t*, 523 U.S. 83, 86 (1998) (“EPCRA establishes a framework of state, regional, and local agencies designed to inform the public about the presence of hazardous and toxic chemicals, and to provide for emergency response in the event of health-threatening release.”).

¹⁶ The List of Extremely Hazardous Substances and Their Threshold Planning Quantities, 40 C.F.R. pt. 355, app. A (2026).

¹⁷ 42 U.S.C. §§ 11004, 1104(a)(2), (b)(1), (b)(2), (c); 40 C.F.R. pt. 355 (2026).

¹⁸ See 40 C.F.R. § 355.42(a)(1) (requiring facility operators to provide immediate emergency release notification information to “[t]he community emergency coordinator for the LEPC of any area likely to be affected by the release” and “[t]he SERC of any State likely to be affected by the release”). See also 42 U.S.C. § 11001(c) (requiring committees to include a range of elected state and local

includes the name and estimated quantity of the substance released, the time and duration of the release, as well as:

Any known or anticipated acute or chronic health risks associated with the emergency and where appropriate, advice regarding medical attention necessary for exposed individuals[;] Proper precautions to take as a result of the release...[;] [and] The name and telephone number of the person or persons to be contacted for further information.¹⁹

The SERC must promptly notify the state agency that enforces the requirements of the Safe Drinking Water Act in the state as well as “any relevant community water system the source waters of which are affected by the release.”²⁰ When practicable, the facility must also submit to these same local agencies a written follow-up emergency notification (“follow-up report” or “follow-up notification”) wherein facilities must “provide and update the information required in the immediate notification and include additional information with respect to” actions taken to respond to the release; known or anticipated health risks associated with the release; and where appropriate, advice regarding medical attention necessary for

officials, establish rules “for public notification of committee activities, public meetings to discuss the emergency plan, . . . and distribution of the emergency plan,” establish “procedures for receiving and processing requests from the public for information,” and designate “an official to serve as coordinator for information.”); 42 U.S.C. § 11003 (requiring local emergency planning committees to prepare and implement an emergency plan).

¹⁹ 42 U.S.C. § 11004(b)(2).

²⁰ 42 U.S.C. § 11004(e).

exposed individuals.²¹ Importantly, pursuant to EPCRA’s community-right-to-know mandate, follow-up reports and emergency plans must be made available to the public upon request, and LEPCs must provide public notice that those who wish to review either may do so at a designated location.²²

A. Section 304 Reporting Enables Local Agencies to Safely and Timely Respond to Emergency Releases and Effectively Plan for Emergencies

EPCRA’s focus on emergency planning and preparedness by LEPCs²³ differentiates it from the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. Chapter 103. Section 304 immediate notifications alert local agencies to emergency releases and provide them with critical information about the release, thereby enabling local agencies to develop emergency plans,²⁴ and to timely, appropriately, and safely respond to release-related emergencies. This information is critical to saving lives when emergency

²¹ 40 CFR § 355.40.

²² 42 U.S.C. § 11044.

²³ See generally U.S. Env’t Prot. Agency, *2008 Nationwide Survey of Local Emergency Planning Committees (LEPCs)* 3 (2008) (noting “[b]ecause of their broad-based membership, LEPCs are able to foster a valuable dialogue within the community to prevent and prepare for accidental . . . releases of hazardous chemicals”).

²⁴ See David M. Bearden & Richard K. Lattanzio, Cong. Rsch. Serv., *EPA’s Role in Emergency Planning and Notification at Chemical Facilities* i (2017) (“EPCRA helps ensure local communities and first responders have needed information on potential chemical hazards within their communities in order to develop community emergency response plans.”).

releases occur, no less so when a release is due to emissions from AFOs.²⁵ In *Waterkeeper Alliance. v. Environmental Protection Agency*, this Court recognized the value of reporting emissions from animal waste at CAFOs. Recounting comments to EPA’s 2008 rule, this Court noted that “‘when [manure] pits are agitated for pumping,’ hydrogen sulfide, methane, and ammonia ‘are rapidly released from the manure and may reach toxic levels or displace oxygen, increasing the risk to humans and livestock,’”²⁶ and further stated that “risk isn’t just theoretical; people have become seriously ill and even died as a result of pit agitation.”²⁷ The Court then cited comments highlighting possible local responses to such scenarios, the “role of information in enabling responses by local officials”²⁸ and in particular, the function of immediate reporting in providing “crucial information” to local responders, without which, responders may be

²⁵ Indeed, as far back as 2008, the National Association of SARA Title III Program Officials, a national association representing state and local emergency responders with EPCRA responsibilities, advised against exempting AFOs from reporting requirements because an exemption would deny responders and the public the information necessary to protect themselves from dangerous releases. U.S. Gov’t Accountability Off., GAO-08-944, *Concentrated Animal Feeding Operations* 40 (Sep. 4, 2008).

²⁶ *Waterkeeper All. v. Env’t Prot. Agency*, 853 F.3d 527, 536 (D.C. Cir. 2017) (quoting CERCLA/EPCRA Administrative Reporting Exemption for Air Releases of Hazardous Substances From Animal Waste at Farms, 73 Fed. Reg. 76948, 76957 (Dec. 18, 2008)).

²⁷ *Id.* (citing K.J. Donham, *Community & Occupational Health Concerns in Pork Production: A Review*, 88 J. Anim. Sci. 102, 107 (2010)).

²⁸ *Id.*

“forced to blindly drive through an area not knowing what they are looking for.”²⁹

Immediate notification is critical for LEPCs to receive information about the risk of civilian or first responder exposure to potentially life-threatening releases of hydrogen sulfide. The failure to provide such information pursuant to EPCRA puts responders at higher risk as fatalities are not uncommon due to bystander rescue attempts at the scene.³⁰

B. Section 304 Written Follow-up Reports Facilitate Needed Public Health Research, Provide Communities With Information Critical to Their Health and Well-Being, Provide a Basis on Which Communities Can Hold Facilities Accountable, and Incentivize Emissions Reductions

Emergency reporting under EPCRA is a statutorily mandated and unique resource for building needed knowledge about industry impacts and informing comprehensive emergency plans for all communities.³¹ While the science on the

²⁹ *Id.*, at 536–37 (quoting Comment Letter from Timothy R. Gablehouse, Pres., Nat’l Ass’n of SARA Title III Program Officials, to Superfund Docket, U.S. Env’t Prot. Agency at 2 (Mar. 27, 2008)); *see also* Comment Letter from W.A. Drew Edmondson, Okla. Att’y Gen., to Superfund Docket, U.S. Env’t Prot. Agency at 3 (Mar. 27, 2008).

³⁰ See J. Nicholas Hoover, *Can’t You Smell That Smell: Clean Air Act Fixes for Factory Farm Air Pollution*, 6 *Stan. J. Animal L. & Pol’y* 1, 2 (2013) (“[In] 2007, a Virginia farmer climbed into a manure pit to unclog a pipe, and succumbed almost instantly to deadly fumes. In the scramble to save him, his wife, two young daughters, and a farmhand each suffered the same fate. A year later, Minnesota public health officials urged residents living within a mile of a massive dairy farm to evacuate after hydrogen sulfide fumes spiked to more than 200 times the state air quality limits[.]”).

³¹ See Danielle M. Purifoy, *EPCRA: A Retrospective on the Environmental Right-*

impacts of emissions from AFOs on health and the environment is clear, scholars have called for more precise CAFO-related emissions data to guide decision-making across the health and agricultural sectors and to conduct essential research on harms related to CAFO emissions to inform public health and environmental policy.³² Outside of the context of AFOs, in sectors where emergency reporting is not exempted, reporting under EPCRA has proven to be an important source of information for researchers, advocacy organizations, government, media, and

to-Know Act, 13 *Yale J. Health Pol’y L. & Ethics* 375, 382 (2013) (arguing EPCRA is an “invaluable resource” for building knowledge and emergency planning).

³² See, e.g., Alyssa M Burns et al., *Data Gap: Air Quality Networks Miss Air Pollution From Concentrated Animal Feeding Operations*, 57 *Env’t Sci. & Tech.* 20718, 20722–23 (2023) (finding, *inter alia*, insufficient data on AFOs prevents accurate assessment); Tyler J. S. Smith et al., *Availability of Information about Airborne Hazardous Releases from Animal Feeding Operations* 8 *PLoS ONE* e85342, 5–7 (2013) (finding EPCRA reports of AFO emissions were largely unavailable across four states with large numbers of poultry, swine, and dairy operations, and suggesting revision of EPA’s AFO exemption may increase availability of information relevant to the health of populations living or working near AFOs); Elise Pohl & Sang-Ryong Lee, *Local and Global Public Health and Emissions from Concentrated Animal Feeding Operations in the USA: A Scoping Review*, 21 *Int’l J. Env’t. Res. & Pub. Health* 916, 916 (2024) (arguing a shortage of evidence on the impacts of CAFO waste emissions may hinder effective policy development); Ji-Young Son et al., *Density of Animal Feeding Operations, Including Concentrated Animal Feeding Operations (CAFOs), and Cancer Incidence: A County-Level Ecological Study Across Three U.S. States*, 299 *Env’t. Rsch.* 1, 1, 6 (2026) (finding associations between AFO exposure and increased cancer incidence in residential communities but calling for more exposure data to clarify the relationship and guide effective policy responses) ; see also Nat’l Rsch. Council, *Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs*, 6 (2003) ; U.S. Gov’t Accountability Off., *supra* note 25, at 6.

communities.³³

CONCLUSION

For the foregoing reasons, Amici respectfully submit this brief in support of Appellants' request that this Court vacate the 2019 Rule.

DATED: April 14, 2026

Respectfully submitted,

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³³ See U.S. Env't Prot. Agency, *EPCRA Milestones Through the Years* (last updated Sep. 4, 2025) <https://www.epa.gov/epcra/epcra-milestones-through-years> (noting that the toxic release inventory allowed community members, researchers, investors, and government agencies to make more informed decisions and created "a strong incentive for companies to reduce pollution and be good neighbors in their Communities"); U.S. Env't Prot. Agency, *TRI Data in Action* (last updated Jan. 23, 2026) <https://www.epa.gov/toxics-release-inventory-tri-program/tri-data-action-0> (providing a sampling of the various uses of toxic release inventory data and stakeholders that have used the data); Purifoy, *supra* note 32, at 378 (stating that EPCRA has been instrumental in improving industry transparency to its neighbors and the larger public and increasing self-policing of industries of their emissions "to appease investment stakeholders and to prevent costly waste from inefficiencies at their facilities").

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APPENDIX A

ANNOTATED PARTIAL BIBLIOGRAPHY OF PEER-REVIEWED LITERATURE

Offsite Migration of Hydrogen Sulfide and Ammonia from AFOs

Bin Yuan, et al., *Emissions of Volatile Organic Compounds (VOCs) from Concentrated Animal Feeding Operations (CAFOs): Chemical Compositions and Separation of Sources*, 17 Atmospheric Chemistry & Physics 4945 (2017). NH₃ emissions from animals and their waste led to elevated NH₃ concentrations at locations downwind of dairy, beef, and poultry AFOs, well beyond facility fences.

Ian C. Rumsey & Aneja P. Viney, *Measurement and Modeling of Hydrogen Sulfide Lagoon Emissions from a Swine Concentrated Animal Feeding Operation*, 48 Env't Sci. & Tech. 1609 (2014). H₂S fluxes are meteorologically capable of traveling multiple kilometers beyond AFO boundaries, with seasonal variability and downwind concentration persistence.

L. Jones et al., *Upwind Impacts of Ammonia from an Intensive Poultry Unit*, 180 Env't Pollution 221 (2013). NH₃ emissions from an intensive poultry unit were detected up to 2.8 kilometers upwind of the facility, contributing to exceedance of critical levels of NH₃ 800 meters upwind.

Kelley J. Donham et al., *Assessment of Air Quality at Neighbor Residences in the Vicinity of Swine Production Facilities*, 11 J. Agromedicine 15 (2006). Air surrounding homes neighboring AFOs had H₂S levels exceeding federally recommended limits.

Sacoby M. Wilson & Marc L. Serre, *Examination of Atmospheric Ammonia Levels Near Hog CAFOs, Homes, and Schools in Eastern North Carolina*, 41 Atmospheric Env't 4977 (2007). There are high weekly average NH₃ concentrations near hog AFOs, suggesting dangerous levels of exposure for populations living or attending school nearby.

Health Impacts of Hydrogen Sulfide and Ammonia from CAFOs

Goran Gržinić et al., *Intensive Poultry Farming: A Review of the Impact on the Environment and Human Health*, 858 Sci. Total Env't 160014 (2023). NH₃

generated by intensive poultry farming has been associated with odor annoyance and respiratory symptoms of neighboring populations.

Wendee Nicole, *CAFOs and Environmental Justice: The Case of North Carolina*, 121 *Env't Health Persp.* A182 (2013). H₂S levels were strongly related to odor from AFOs. Air pollution measures of odor, endotoxin, H₂S, and inhalable particulate matter were associated with increased respiratory difficulty, sore throat, chest tightness, nausea, and eye irritation. H₂S and semivolatile particles were linked to reports of feeling stressed, annoyed, nervous, and anxious.

Leah Schinasi et al., *Air Pollution, Lung Function, and Physical Symptoms in Communities Near Concentrated Swine Feeding Operations*, 22 *Epidemiology* 208 (2011). H₂S, endotoxin, and particulate matter measured near AFOs were related to acute eye, nose, and throat irritation, increased incidents of difficulty breathing, increased wheezing, chest tightness, and nausea among people living within 1.5 miles of CAFOs.

Michael Greger & Gowri Koneswaran, *The Public Health Impacts of Concentrated Animal Feeding Operations on Local Communities*, 33 *Family & Community Health* 11 (2010). Residents in communities neighboring AFOs are at increased risk of developing neurobehavioral symptoms and respiratory illnesses due to air contaminants including H₂S, NH₃, antimicrobials, skin cells, feed, and fungi. H₂S is regarded as the most dangerous of all the gaseous by-products of farm animal manure decomposition.

Steve Wing et al., *Air Pollution and Odor in Communities Near Industrial Swine Operations*, 116 *Env't Health Persp.* 1362 (2008). Individuals living within 1.5 miles of swine AFOs altered or ceased normal daily activities when H₂S concentrations and associated hog odor were the highest.

Susan S. Schiffman et al., *Symptomatic Effects of Exposure to Diluted Air Sampled from a Swine Confinement Atmosphere on Healthy Human Subjects*, 113 *Env't Health Persp.* 567 (2005). Those exposed to diluted swine air containing H₂S, NH₃, particulates, endotoxin, and odor were more likely to report eye irritation, nausea, and headaches than a control group exposed to clean air.

Alan R. Hirsch, *Hydrogen Sulfide Exposure Without Loss of Consciousness: Chronic Effects in Four Cases*, 18 *Toxicology & Indus. Health* 51 (2002). Exposure to H₂S, which is produced by the breakdown of animal waste, can lead to neurological damage even at low levels.

CERTIFICATE OF COMPLIANCE

Pursuant to Federal Rule of Appellate Procedure 29(a)(4)(G), I hereby certify that this brief complies with the type-volume limitations of Fed. R. App. P. 32(a)(7)(B) and Fed. R. App. P. 29(a)(5) because it contains fewer than 4,000 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(f).

I further certify that this brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type-style requirements of Fed. R. App. P. 32(a)(6) as it has been prepared in Microsoft Word 365 using 14-point Times New Roman typeface and is double-spaced (except for headings, footnotes, and block quotations).

CERTIFICATE OF SERVICE

I hereby certify that on this 14th day of April 2026, I electronically filed the foregoing brief with the Clerk of the Court for the United States Court of Appeals for the District of Columbia Circuit using the Court's CM/ECF system. Counsel for all parties to the case are registered CM/ECF users and will be served by the appellate CM/ECF system.

DATED: April 14, 2026

/s/ Marianne Engelman-Lado
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