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June 30, 2014

Dough Szenher
Arkansas Department of Environmental Quality
5301 Northshore Dr.
North Little Rock, AR 72118

Re: Public Comment-Reg. 5 and Reg. 6 Rulemakings

Mr. Szenher:

I am writing in support of the proposed changes to Arkansas Pollution Control and Ecology Commission Regulations 5 and 6 to ban medium and large swine CAFOs in the Buffalo River Watershed. CAFOs impose community health risks that place citizens, especially those with increased susceptibility such children, the elderly, and those with preexisting health impairments in a vulnerable situation due to impaired air quality. All community members are at risk from lowered air quality, however children take in 20-50% more air than adults making them more susceptible to lung disease and health effects.[1]

Medium and large swine CAFOs expose citizens in the surrounding area to a "complex mixture of particulates, gases and vapors" that have been documented to cause "acute and chronic respiratory diseases."[2] It has been concluded that CAFO air emissions may constitute a public health hazard and that precautions should be taken to minimize both

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[1] Kleinman, M. (2000). *The health effects of air pollution on children*. http://www.aqmd.gov/docs/default-source/students/health-effects.pdf?sfvrsn=0

[2]Iowa Concentrated Animal Feeding Operations Air Quality Study. Iowa State University and the University of Iowa Study Group. February 2002 http://www.public-health.uiowa.edu/ehsrc/CAFOstudy/CAFO_1.pdf

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specific chemical exposures (hydrogen sulfide and ammonia) and mixed exposures (including odor) arising from CAFOs."[3]

The emissions from CAFOs of most concern are ammonia, hydrogen sulfide, odor, and particulate matter. The rulemakings will protect the residents and visitors of the Buffalo River Watershed from the negative health and environmental impacts that are inflicted by an increase in medium and large swine CAFOs.

Ammonia

Hazardous gases and vapors are emitted from swine barns, lagoons, manure storage piles and from sites of manure land application.[4] Many of these agents are sensory and respiratory irritants. One such toxin emitted by CAFOs is ammonia. Ammonia is a component of animal waste that is released in the waste treatment process. Ammonia is rapidly absorbed into the upper airways and can lead to sever coughing and mucous production and result in scarring of the upper and lower airways. It can also irritate eyes, sinuses, and skin.

Hydrogen Sulfide

Hydrogen sulfide is a potent neurotoxin that chronic exposure to even low ambient levels causes irreversible damage to the brain and central nervous system. Children are among

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[3] Iowa Concentrated Animal Feeding Operations Air Quality Study. Iowa State University and the University of Iowa Study Group. February 2002 http://www.public-health.uiowa.edu/ehsrc/CAFOstudy/CAFO_1.pdf

[4] Iowa Concentrated Animal Feeding Operation Air Quality Study. Iowa State University. 2003. https://www.public-health.uiowa.edu/ehsrc/CAFOstudy/CAFO_finalChap_3.pdf

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the most susceptible to this poison gas.[5] It smells like rotten eggs and is a prominent component of the odors released from CAFOs.

The location of CAFOs close to schools, neighborhoods and daycare facilities can have serious health impacts on the children. In one case a home-based day care center in Minnesota suffered hydrogen sulfide poisoning when winds blew from the south after two factory-scale hog farms opened less than a mile and half away. The facility had to be evacuated and seventeen children experienced diarrhea, nausea, headaches, vomiting, teary eyes, and stuffy noses.[6]

Odor

Odors are one of the most significant community concerns associated with CAFOs. "The chemicals that evoke these odors can be extreme nuisance and can induce adverse health effects with sufficient exposure."[7] The odors emitted by CAFOs are a combination of ammonia, hydrogen sulfide, and carbon dioxide, as well as volatile and semi-volatile organic compounds.[8] Studies conducted on the impact of odor experienced by

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[5] J Environ Sci Health B, 200003, 35: 2,245-58)

[6] Marks Robbin. Cesspools of Shame- How Factory Farm Lagoons and Sprayfields Threaten Environmental and Public Health. Natural Resource Defense Council and the Clean Water Network. July 2001. http://www.nrdc.org/water/pollution/cesspools/cesspools.pdf

[7] Iowa Concentrated Animal Feeding Operation Air Quality Study. Iowa State University. 2003. https://www.public-health.uiowa.edu/ehsrc/CAFOstudy/CAFO_finalChap_3.pdf

[8] Heederik, D., Sigsgaard, T., Thorne, P.S., Kline, J.N., Avery, R., Bønløkke, et al. (2007). Health effects of airborne exposures from concentrated animal feeding operations. *Environmental Health Perspectives, 115*(2), 298–302. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/ PMC1817709/pdf/ ehp0115-000298.pdf

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community residents living in proximity to CAFOs have found "negative mood states"[9] along with increased symptoms of "headache, runny rose, sore throat, excessive coughing, diarrhea, burning eyes and reduced quality of life."[10]

Particulate Matter

Bioaerosols, particulates of biological origin suspended in air, are a major component of the particulate matter from CAFOs. They can include "bacteria, fungi, fungal and bacterial spores, viruses, mammalian cell debris, products of microorganisms, pollens, and aeroallergens."[11] Such particulate matter can cause a direct inflammatory response to inhaled allergens and dust can also convey inflammatory and/or irritating gases or chemicals deeper in the lungs thereby enhancing their toxic effects.[12] CAFOs emit particulate matter and suspended dust, which is linked to asthma and bronchitis. An exposure to particulate over a long time period can lead to decreased lung function.[13]

Studies

Many scientific studies have been done on the impacts of the emissions from CAFOs. Here are highlights from a few of those studies:

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[9] Wing and Wolf. Intensive livestock operations, health, and quality of life among eastern North Carolina residents. Environ Health Perspect. Mar. 200; 108(3):233-238. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637983/

[10] Wing and Wolf. Intensive livestock operations, health, and quality of life among eastern North Carolina residents. Environ Health Perspect. Mar. 200; 108(3):233-238. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1637983/

[11] Iowa Concentrated Animal Feeding Operation Air Quality Study. Iowa State University. 2003. https://www.public-health.uiowa.edu/ehsrc/CAFOstudy/CAFO_finalChap_3.pdf

[12] Iowa Concentrated Animal Feeding Operation Air Quality Study. Iowa State University. 2003. https://www.public-health.uiowa.edu/ehsrc/CAFOstudy/CAFO_finalChap_3.pdf

[13] Michigan Department of Environmental Quality Toxics Steering Group, 2006.

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"**A study on human health effects of living near industrial hog operations has found that people living near large hog farms suffer significantly higher levels of upper respiratory and gastrointestinal ailments than people living near other farming areas**. The study was done by the University of North Carolina, School of Public Health." (*Kansas Rural Papers,* May 1999)

"A Minnesota Pollution Control Agency study using a computer model found that hydrogen sulfide levels could be expected as far as five miles downwind from confinement sites." (Des Moines Register, 10-25-98)

Residents living within 2 miles of a 4,000 hog confinement reported significantly more respiratory problems than other residents. (Institute for Rural and Environmental Health, Univ. of Iowa, 1997)

Research from South Sioux City, Nebraska found reports of respiratory problems in children increased 20 to 40 percent when hydrogen sulfide levels in the air exceeded 30ppb (Agency for Toxic Substances and Disease Registry, 2002)

Researchers have found that the closer children live to a CAFO, the greater the risk of asthma symptoms.[14] Michigan Department of Environmental Quality Toxics Steering Group, 2006.

Increased Asthma Found Among Iowa Children Living On Hog Farms- Research conducted by investigators in the University of Iowa College of Public Health has found that the prevalence of asthma is elevated among children living on farms where swine are raised. Children living on swine farms where antibiotics are added to feed have a significantly higher prevalence of the respiratory disease, according to the UI study. (University of Iowa News Release, Dec. 9 2004)

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[14] Barrett, J.R. (2006). Hogging the air: CAFO emissions reach into schools. *Environmental Health Perspectives 114*(4), A241. http://ehp03.niehs.nih.gov/article/ info%3Adoi%2F10.1289%2Fehp.114-a241a

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Children who attend school near large-scale CAFOs may be at higher risk for asthma.[15] Sigudarson ST, Kline JN. 2006. School proximity to concentrated animal feeding operations and prevalence of asthma in students. *Chest.* Jun; 129 (6): 1486-91.

I have attached several of the articles cited herein. Please accept these as part of this comment. Research has demonstrated the public health impacts of CAFOs have grave consequences on communities nearby, especially children. The rulemakings will protect residents and visitors of the Buffalo River Watershed from these adverse impacts. I urge you to adopt the rulemakings.

Sincerely,

John Whiteside
Policy Director, Arkansas Public Policy Panel

[15] Sigudarson ST, Kline JN. 2006. School proximity to concentrated animal feeding operations and prevalence of asthma in students. *Chest.* Jun; 129 (6): 1486-91.