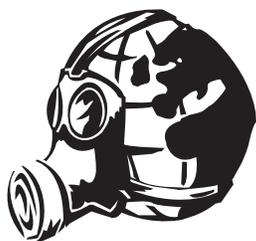




Hydrogen Sulfide & Factory Farms

How a group of rural residents made Minnesota hog factories accountable for the hydrogen sulfide gas they produce.

Hydrogen sulfide (H₂S) is a gas emitted when large amounts of liquid animal waste are collected in one location. Although it is mostly known for its “rotten egg” smell, hydrogen sulfide is more than a nuisance. Exposure to H₂S in parts per billion concentrations can cause symptoms such as nausea, headaches, loss of appetite and irritability. More extreme symptoms include vomiting and severe diarrhea. Exposure to extremely high amounts of H₂S gas — over 300 parts per million — over a short period of time can bring on life-threatening pulmonary edema.^{1,2}



Sick citizens

In the spring of 1995, members of the Julie and Jeff Jansen family of rural Renville County began experiencing nausea, headaches, vomiting, severe diarrhea and other illnesses. The previous fall, two manure lagoons owned by hog giant ValAdCo had gone into operation roughly a mile from the Jansen home.

Many of the symptoms the Jansens were suffering from have been documented in people who have been poisoned by exposure to hydrogen sulfide. In a written statement, the family’s physician, Dr. Paul Thompson of Olivia, Minn., concluded that the odors produced by the lagoons were causing the Jansens’ illnesses.³ Informal surveys showed other Renville County residents living next to lagoons were suffering negative health effects as well. State officials received so many complaints that in the fall of 1995 Minnesota Department of Health investigators visited several homes in the county. They concluded many rural residents were indeed getting sick, and ruled out any “in-house” causes for the symptoms.⁴

Citizen action

After several unsuccessful attempts to get the Minnesota Pollution Control Agency (MPCA) to conduct more extensive air quality tests in the area, several Land Stewardship Project (LSP) members took matters into their own hands. In 1996, Julie Jansen borrowed a Jerome Analyzer from the Arizona Instrument Corp. An air quality

expert provided training on how to use the highly sophisticated gas testing instrument. In May 1996, LSP staff met with local citizens twice to plan a series of tests for H₂S gas emissions. The late Paul Homme, who was a Land Stewardship Project board member at the time, set up the testing system and coordinated the sampling.⁵ Homme was past director of the microbiology branch of the U.S. Air Force’s epidemiology division and has extensive experience setting up scientific investigations.

During a two-week period in May 1996, Jansen, Homme and others tested the air near 17 large-scale hog manure lagoons in the county. Several local residents and witnesses from around the state helped conduct a total of 32 hydrogen sulfide emissions tests in Renville County. The testers stood on public roadways while taking readings. Samples were gathered within a few yards of the facilities as well as up to a mile and a half away. Each test consisted of taking 13 samples of air during a one-hour period. The readings of those samples were then averaged to provide a mean for that one-hour period. Testers recorded the date, air temperature and wind speed.

The test results

All of the sites sampled showed some hydrogen sulfide in the air. In all, five different lagoons, representing ownership by four different entities, recorded mean hourly reduced H₂S levels of more than 50 parts per billion. In other words, those particular lagoons were producing the toxic gas in concentrations of more than 50 parts per billion during a *one-hour period*. That’s important, because Minnesota air quality standards call for levels of hydrogen sulfide not to exceed 50 parts per billion for a *half-hour period* more than two times a year, or more than 30 parts per billion more than two times in any five consecutive days. Based on this, these tests indicated that state air quality standards were violated during the sampling.

In addition, two of the tests showed mean reduced hydrogen sulfide levels of more than 100 parts per billion, with one site measuring 134 parts per billion. High readings were taken within several yards of the lagoons as well

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as up to a mile and a half away.⁵

The bureaucratic response

A Minnesota Department of Health review of the testing methods and results concluded that the citizen study was done properly and that hydrogen emissions from the facilities exceeded 50 parts per billion during the monitoring. The Department of Health went on to conclude that this represented a potential public health concern and appropriate action was needed to reduce these emissions.³ MPCA officials conceded that the citizen testing showed a possible violation of that state's air quality standards.⁶

The citizen response

LSP released the results of the tests in June 1996 via a series of charts and press releases. Homme made himself available to the media and government officials to explain the results.

Despite the meticulous nature of the testing and the Department of Health's seal of approval, factory farm proponents dismissed the monitoring results as unscientific and biased, and continued to pressure the MPCA to institute no further restrictions on mega-sized livestock operations.

LSP members and volunteers organized a letter-writing campaign targeting the MPCA in July and August of 1996. This generated more than 5,000 postcards calling for an end to MPCA permits for factory farms. Citizen pressure on the MPCA and then-Governor Arne Carlson continued throughout the fall and winter.

In January 1997, LSP, the Minnesota Farmers Union, the Minnesota Catholic Conference and Minnesota COACT held public meetings across the state to organize public support for a series of proactive reforms to address the problem of livestock concentration and factory farms. The following month, a conference on the health and environmental impacts of factory farms further highlighted the adverse effects of factory farms, including hydrogen sulfide emissions.

This no-nonsense approach to releasing the test results, combined with the follow-up pressure by concerned citizens, helped convince certain elected officials and the general public that there were serious emission problems associated with hog factories in Renville County. As a result, during the 1997 session of the Minnesota Legislature, LSP and its allies worked with legislators to push through a law that was the direct result of the citizen hydrogen sulfide testing. The law required the MPCA to develop a protocol for enforcing air quality standards related to hydrogen sulfide emissions.

Under the law, the MPCA must use portable survey instruments when testing air quality near large livestock confinement facilities. This strategy will likely make the agency better able to respond to complaints from a wide geographic area. Permanent monitoring stations provide accurate readings at a few specific sites, but leave little room for responding to complaints from different parts of the state. They also do not take into account subtle changes in wind direction.

Proactive measures

But the citizen testing went beyond creating stricter regulations of ongoing problems. It also prompted LSP to draft and lawmakers to pass legislation supporting alternative livestock production methods that don't produce toxic levels of hydrogen sulfide in the first place. As part of the odor research initiative, the Minnesota Institute for Sustainable Agriculture received \$125,000 for researching, developing and promoting low-emission and low-energy alternative hog production systems such as hoop houses, the Swedish system and pasture farrowing. In 1998, the Minnesota Legislature provided more funds for establishing alternative swine research facilities at the University of Minnesota's West Central Research and Outreach Center in Morris.⁷

Sources

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