

Calculation Worksheet – Ammonia and Hydrogen Sulfide Emissions

Swine Operations – Confinement with liquid manure management systems

February _____, 2009

KEEP THIS WORKSHEET FOR YOUR RECORDS-DO NOT SUBMIT WITH YOUR REPORT

The final rule on EPCRA reporting issued by EPA on December 18, 2008 and effective January 20, 2009 requires reporting of ammonia and hydrogen sulfide emissions **if** the swine facility has 2500 or more swine over 55 pounds, or 10,000 swine under 55 pounds; **and** the ammonia exceeds 100 lbs/day **or** the hydrogen sulfide exceeds 100 lbs/day. If the ammonia or hydrogen sulfide is less than 100 lbs/day, enter "N/A" in the appropriate cell in the reporting form.

Swine Facility Name: _____.

The emissions estimates are derived from research reported by:

Gay, S.W., D.R. Schmidt, C.J. Clanton, K.A. Janni, L.D. Jacobson, S. Weisberg. 2003. Odor, Total Reduced Sulfur and Ammonia Emissions from Animal Housing Facilities and Manure Storage Units in Minnesota. Applied Engineering in Agriculture, 19(3) 347-360, ASABE, St. Joseph, MI.;

and:

Jacobson, L.D., A.J. Heber, S.J. Hoff, Y. Zhang, D.B. Beasley, J.A. Koziel, and B.P. Hetchler. 2006. Aerial Pollutants Emissions from Confined Animal Buildings. Summary report, Ag Air Workshop, USDA-IFAFS research and demonstration program.

These values are a good faith estimate of emissions from swine operations using typical confinement housing and manure storages and located in a temperate climate.

AMMONIA (NH₃) EMISSIONS ESTIMATE

Enter your head count in the blank and multiply times the appropriate Emission Rate to equal the emission estimate for the facility.

AMMONIA (NH₃) EMISSIONS ESTIMATE				
	Lowest Head Count		Lower Bound NH ₃ Emission Rate (pounds/hd/day)	NH₃ Lower Bound (pounds/day)
NH₃ Lower Bound =		X		=
	Permitted Head Count		Upper Bound NH ₃ Emission Rate (pounds/hd/day)	NH₃ Upper Bound (pounds/day)
NH₃ Upper Bound =		X		=

Hydrogen Sulfide (H₂S) EMISSIONS ESTIMATE

Enter your head count in the blank and multiply times the Emission Rate to equal the emission estimate.

Hydrogen Sulfide (H₂S) EMISSIONS ESTIMATE				
	Lowest Head Count		H ₂ S Emission Rate (pounds/hd/day)	H₂S Lower Bound (pounds/day)
H₂S Lower Bound =		X		=
	Permitted Head Count		H ₂ S Emission Rate (pounds/hd/day)	H₂S Upper Bound (pounds/day)
H₂S Upper Bound =		X		=

Table 1. Swine facility per-animal emission constants. Liquid Manure Systems. Housing and manure storage estimates are combined.

Management group	Pull-plug, scrape, flush, shallow pit		Deep Pit	
	Upper bound	Lower bound	Upper bound	Lower bound
Breeding & gestation	NH ₃ 0.098	NH ₃ 0.0098	NH ₃ 0.052	NH ₃ 0.0052
	H ₂ S 0.016	H ₂ S 0.0016	H ₂ S 0.0085	H ₂ S 0.00085
Farrowing	NH ₃ 0.16	NH ₃ 0.016	NH ₃ 0.022	NH ₃ 0.0022
	H ₂ S 0.030	H ₂ S 0.0030	H ₂ S 0.0028	H ₂ S 0.00028
Nursery	NH ₃ 0.019	NH ₃ 0.0019	NH ₃ 0.0046	NH ₃ 0.00046
	H ₂ S 0.0043	H ₂ S 0.00043	H ₂ S 0.0020	H ₂ S 0.00020
Grow-finishing	NH ₃ 0.055	NH ₃ 0.0055	NH ₃ 0.037	NH ₃ 0.0037
	H ₂ S 0.0104	H ₂ S 0.00104	H ₂ S 0.0080	H ₂ S 0.00080