Calculation Worksheet – Ammonia and Hydrogen Sulfide Emissions

Swine Operations

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 of Section 4 in the reporting form.

Swine Facility Name: _____.

AMMONIA (NH_3) 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 (NH_3) EMISSIONS ESTIMATE					
	Lowest Head Count		Lower Bound NH_3 Emission Rate (pounds/hd/day)		**NH_3 Lower Bound** (pounds/day)
NH_3 Lower Bound =		**X**		=	
	Permitted Head Count		Upper Bound NH_3 Emission Rate (pounds/hd/day)		**NH_3 Upper Bound** (pounds/day)
NH_3 Upper Bound =		**X**		=	

Hydrogen Sulfide (H_2S) EMISSIONS ESTIMATE

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

Hydrogen Sulfide (H_2S) EMISSIONS ESTIMATE					
	Lowest Head Count		H_2S Emission Rate (pounds/hd/day)		**H_2S Lower Bound** (pounds/day)
H_2S Lower Bound =		**X**		=	
	Permitted Head Count		H_2S Emission Rate (pounds/hd/day)		**H_2S Upper Bound** (pounds/day)
H_2S Upper Bound =		**X**		=	

Table 1. Swine facility per-animal emission constants. Housing and manure storage estimates are combined. Upper Bounds.

Management group	Pull-plug, scrape, flush, shallow pit	Deep Pit
Breeding & gestation	NH_3 0.098 H_2S 0.016	NH_3 0.052 H_2S 0.0085
Farrowing	NH_3 0.16 H_2S 0.030	NH_3 0.022 H_2S 0.0028
Nursery	NH_3 0.019 H_2S 0.0043	NH_3 0.0046 H_2S 0.0020
Grow-finishing	NH_3 0.055 H_2S 0.0104	NH_3 0.037 H_2S 0.0080

Table 2. Swine facility per-animal emission constants. Housing and manure storage estimates are combined. Lower bounds.

Management group	Pull-plug, scrape, flush, shallow pit	Deep Pit
Breeding & gestation	NH_3 0.0098 H_2S 0.0016	NH_3 0.0052 H_2S 0.00085
Farrowing	NH_3 0.016 H_2S 0.0030	NH_3 0.0022 H_2S 0.00028
Nursery	NH_3 0.0019 H_2S 0.00043	NH_3 0.00046 H_2S 0.00020
Grow-finishing	NH_3 0.0055 H_2S 0.00104	NH_3 0.0037 H_2S 0.00080

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.