RESEARCH ABSTRACT

ENVIRONMENT

Title: Quantifying Volatile Organic Compound Interaction With Particulate Matter For The Development Of Odor Transport Models – **NPB# 01-088**

Investigator: KC Das

Institution: The University of Georgia

Co-Investigators: S Hassan, JR Kastner, G. Van Wicklen, Rick Jones

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ABSTRACT

A method of extracting the organics adsorbed to dust particles was developed and tested with dust collected from two commercial hog growing operations. Five aldehydes, one alkane, and hydrogen sulfide were consistently measured in dust samples. Dust samples collected were separated into three sizes, small (5 to 20 µ), medium (20 to 40 µ) and large (40 to 75 µ) and analyzed individually. The key results and conclusions from this work are as follows:

1. As much as 85 to 90% of the total mass of dust samples are in the range of 20 to 75 µ size (sampling range = 5 to 75 µ).
2. When a combined analysis including all sizes were conducted to quantify differences based on location of sampling, only three compounds, heptanal, nonanal, and decanal showed differences based on sampling location.
3. Significantly higher hydrogen sulfide, octanal, and nonanal were found in small (5 to 20 µ) size particles when compared to medium and larger samples. All other compounds tested showed no difference based on size of particles.
4. One location (B) showed a greater amount of differences based on when the samples were obtained (warmer weather v. cooler weather). In this case warmer weather tended to have significantly higher concentration of compounds.
5. At location A, only two (decanal and n-octane) of the seven compounds tested showed differences based on when the dust samples were obtained (summer v. winter). In this case the cooler weather conditions resulted in greater amount of compound adsorbed.