

ENVIRONMENT

Title: Development of a National Air Quality Self Assessment Tool (NAQSAT) for swine producers - NPB #07-013

Investigator: Wendy Powers

Institution: Michigan State University

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Industry Summary: Funding from this project was pooled with funding received by industry groups across the U.S. and funding received from the NRCS Conservation Innovation Grant program. As a result, an online tool was developed to assist swine, dairy, beef, laying hen, broiler chicken, and turkey growers. This tool is site-specific and provides guidance to the user without providing emission factors or judgment relative to structures or other producers. The tool is free and publicly available at www.naqsat.tamu.edu. For more information or to contact those involved with development of the tool, please refer to the Resources page at the website above.

Keywords: ammonia, greenhouse gases, hydrogen sulfide, odor, particulates

Scientific Abstract: Air emissions continue to be an important area for management by livestock producers. How to reduce emissions in an effective and affordable manner is of considerable challenge. The objective of this project was to develop an easy-to-use tool that would help swine producers identify where in their operation they could best make management changes in order to reduce air emissions that were identified as a priority by the individual producer. To accomplish our objectives, we assembled a team from 13 states that included researchers, Extension Educators, and industry representatives to develop a tool. The tool needed to be easy to use, based on scientific data, not take much time, able to be used by a producer or their advisor, and accessible to anyone who wished to use it. The intent was not to develop emissions estimates nor rank a producer relative to peers, but to identify how best to address emissions within the confines of existing structures on the operation. The product meets these criteria and provides an opportunity for a user to test the impact a change in behavior or practices will have on resulting emissions from an operation. The product also makes it easy to see how a change to reduce one the emission of a selected pollutant may impact emissions of other pollutants. The product is free (www.naqsat.tamu.edu) and available for use by anyone with targeted audiences of swine, dairy, beef, and poultry producers or their advisors.

Introduction: Producers seek advice from many sources and then need to make decisions on how to move forward. Therefore it is important to provide swine producers with an unbiased approach that helps them make decisions that ultimately lead to improved emissions from their farms.

Objectives: The overarching goal of the proposal team is to provide assistance to producers for making decisions on how best to improve air quality on their livestock operations. This project would fill a current void by providing a user-friendly self-assessment guide that can be proactively utilized without the threat of regulatory intervention. The project

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For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • pork.org

responded to the needs of producers to 1) have readily available information to help them make decisions on how to best improve/manage emissions from their site(s), 2) provide a tool that is accessible, easy to use, and quantitative without the threat of regulatory intervention, and 3) integrate this tool with other currently available tools.

Materials & Methods: The national team met a total of 11 times for 2 half-day meetings to develop the tool. In addition, specie teams held anywhere from 1 to 4 additional meetings. Conference calls were held during the 2.5-year timeframe. The entire project period (September 2007 through March 2010) encompassed conceptualization of the tool, development of the tool, pilot testing (summer 2008), refinement of the tool, coding of the online version, additional field testing (summer 2009) and finalization of the online tool. Throughout this time period, we added additional expertise to the project team, including computer programmers when it was determined that 'easy-to-use' would best be accomplished with an online tool rather than a paper tool. While this added to the duration of the project, the final product better aligns with objectives of the proposal.

VIII. Results: The intended deliverable of this project is complete. The tool is available at www.naqsat.tamu.edu. The tool is built around the best currently available scientific information related to mitigating air quality concerns. Emissions of odor, ammonia, hydrogen sulfide, particulate matter, and greenhouse gases are addressed by the tool. The tool incorporates this information into a decision model that is driven by relevant questions answered by the user in a manner that is site-specific and non-technical. Because we have field tested the tool in multiple states for the swine species, we have evidence that the tool responds as would be expected by experts that served on the project team. Following completion of the tool, the user can access resources to help them make decisions about how to proceed in addressing air emissions of concern.

While this proposal is complete, the project team continues to meet in order to educate users about the tool; its application and benefits and interpretation of results. The education piece includes two archived webinars and a forthcoming user's guide. The webinars are available at:

http://www.extension.org/pages/Archived_Webcasts,_Livestock_and_Poultry_Environmental_Learning_Center#Most_Recent_Webcasts.

Discussion: Greater pressure is placed on swine producers to reduce air emissions. It is not feasible for producers to change their housing or manure storage structures. However, there may be opportunities to improve management and/or add in additional mitigation practices to an existing facility. The intent of the NAQSAT is to help a user identify where within an operation the best opportunity exists to reduce air emissions of interest. The tool breaks the operation into different components (housing, feed, manure storage, manure transportation, land application, mortality management, and neighbor relations) and identifies where opportunities exist. No comparison to other operations is made nor are emissions estimated. Rather, the focus is on improving management and introduction of demonstrated technologies. The tool can be completed in as little as 20 minutes. A user can use the tool multiple times with different scenarios to evaluate the impact a change would have on resulting emissions and consider the tradeoffs that might exist (decrease one emission while increasing another). This tool is designed such that one can use it for their own operation or with the help of a technical advisor.