

**Summary Minutes of the
U.S. Environmental Protection Agency (EPA)
Science Advisory Board Animal Feeding Operations Air Emissions Review Panel
Public Teleconference**

Date and Time: Monday, August 13, 2012, 1:00 pm – 3:30 pm Eastern Time.

Location: Teleconference Only.

Purpose: The purpose of the August 13, 2012 teleconference call was for the Science Advisory Board (SAB) Animal Feeding Operations Air Emissions Review Panel (AFO Panel) to review EPA's responses to the SAB Animal Feeding Operations Emissions Panel members' questions and requests for additional data that were raised at the March 14-16, 2012 SAB Panel meeting.

Participants:

SAB Animal Feeding Operations Air Emissions Review Panel (See Roster, Attachment A):

Dr. David T. Allen, Chair
Dr. Viney Aneja
Dr. Brent Auvermann
Dr. Peter Bloomfield
Dr. Alicia Carriquiry
Dr. Nichole Embertson
Dr. William Faulkner
Dr. Robert Hagevoort
Dr. Richard Kohn
Dr. April Leytem
Dr. Ronaldo Maghirang
Dr. Deanne Meyer
Dr. Wendy Powers
Dr. C. Alan Rotz
Dr. Paul Sampson
Dr. Eric P. Smith
Dr. John Smith
Dr. Eileen Fabian Wheeler
Dr. Lingying Zhao

Drs. Dr. Alicia Carriquiry, Robert Hagevoort and Paul Sampson could not participate during the August 13, 2012 teleconference.

EPA SAB Staff: Mr. Edward Hanlon, Designated Federal Officer

EPA Staff: Mr. Larry Elmore, EPA Office of Air Quality Planning and Standards

Other Attendees: A list of members of the public who attended or requested information for calling into the teleconference call is provided in Attachment B, Public Attendance.

Materials Available: The agenda¹ and teleconference call materials were circulated to the SAB Animal Feeding Operations (AFO) Air Emissions Review Panel in advance of the teleconference, and were made available to the public via the SAB website (www.epa.gov/sab) on the following SAB Animal Feeding Operations Air Emissions Review Panel August 13, 2012 teleconference website:

<http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/5f2a619e899c86cf85257a320040ec55!OpenDocument&Date=2012-08-13>

Teleconference Summary

The teleconference was announced in the Federal Register² and proceeded according to the teleconference agenda¹. A summary of the teleconference call follows.

August 13, 2012

Opening Statements and Welcome

Mr. Edward Hanlon, the Designated Federal Officer (DFO), opened the teleconference call, and made a brief opening statement noting that the SAB Animal Feeding Operations Air Emissions Review Panel is a Federal Advisory Committee under the Federal Advisory Committee Act (FACA). He noted the teleconference was open to the public and that this SAB Panel met on March 14-16, 2012 for the review of two draft EPA documents: a) February 2012 draft document entitled “Development of Emissions Estimating Methodologies for Broiler Animal Feeding Operations”³ (draft Broiler report), and b) February 2012 draft document entitled “Development of Emissions Estimating Methodologies for Lagoons and Basins at Swine and Dairy Animal Feeding Operations”⁴ (draft Lagoons report). He stated that the Panel prepared preliminary responses to the charge questions and requests for additional data and documented those responses and requests in an April 2012 document⁵. He noted that EPA provided a July 2nd response to the Panel's request for additional data⁶, and also submitted supplemental additional data in early August in response to section 3.2.1. of EPA's July 2, 2012 response document⁷. He stated that these Agency-provided and Panel-generated materials were posted onto the teleconference website. He then noted the purpose of the teleconference, and stated that no members of the public had requested to present an oral statement during the teleconference. He stated that one set of written public comments for the teleconference were received and were posted on the teleconference website⁸. He noted that the SAB Staff Office has determined that there were no conflict-of-interest or appearance of a lack of impartiality issues for any Panel members for this review. He noted that minutes of the teleconference were being taken to summarize discussions and action items in accordance with requirements under FACA.

Dr. David Allen, Chair of the Panel, welcomed everyone, and noted the goals, purpose and objectives for the teleconference. He noted that during and after the March 2012 meeting, the Panel requested additional data from EPA. He stated that the purpose of the teleconference call was to review those data responses from EPA and determine whether those responses influenced in a substantive way the Panel's preliminary responses to EPA's charge questions. He commented that he did not want the Panel to get enmeshed in all of the details of the data during the teleconference call. He suggested that the Panel form teams of Panel members assigned to each charge question, and that the teams would review the details of the data and respond on any issues in the SAB's written report that would be prepared. He noted that during the teleconference, the Panel would discuss the two EPA February 2012 Reports sequentially,

starting with the draft Broiler report and followed by the draft Lagoon report. He suggested that the Panel first discuss preliminary key issues and panel recommendations with these two reports that the Panel identified at its March SAB Panel meeting, with a focus on whether EPA's additional data changes any of the Panel's preliminary key issues and recommendations. After that discussion, he suggested that an open Panel discussion occur for any Panel member to raise any comments on any EPA responses to the Panel's specific requests for data, again with a focus towards whether EPA's additional data adjusted any of the Panel's preliminary key issues and recommendations. He noted that he would then summarize the Panel's preliminary responses to the charge questions that were discussed at the Panel's March 2012 meeting, with a focus on whether EPA's additional data changes any of these preliminary responses. He then stated that near the end of the teleconference call, the Panel would discuss any remaining issues, next steps and action items. He also noted that the Panel had another teleconference call scheduled for late October to discuss a draft report that the Panel was planning to draft and release for review.

One Panel member asked whether EPA would discuss the additional data that EPA provided to the Panel for review. Dr. Allen responded that EPA may respond to this question in its opening remarks during the teleconference.

Dr. Allen then welcomed Mr. Larry Elmore of EPA's Office of Air Quality Planning and Standards for his opening remarks. Mr. Larry Elmore made a brief opening statement and noted that he appreciated the Panel's efforts to date. Mr. Elmore stated that since drafting its two February 2012 reports, EPA received new data that supports its analyses in the two EPA reports. Mr. Elmore noted that EPA would use the data before finalizing these two reports.

Dr. Allen then stated that he developed the following list of preliminary key issues and Panel recommendations that were developed at the March 2012 Panel meeting and noted in the Panel's April 2012 preliminary comments on the two EPA February 2012 Reports. He suggested that the following noted Panel members serve as initial discussants on these preliminary key issues and recommendations during this teleconference call:

Draft EPA Broiler Report

- 1) Develop a process-based modeling approach to make predictions of air emissions on Broiler farms.
 - o *Lead Discussants:* Drs. Faulkner, Aneja, Maghirang and Powers
- 2) Improve EPA's statistical approach to developing EEMs.
 - o *Lead Discussants:* Drs. Bloomfield and Eric Smith
- 3) Broiler volatile organic contaminant (VOC) data do not support generating a broiler VOC EEM.
 - o *Lead Discussants:* Drs. Allen and Rotz
- 4) Zero and Negative data values: Diversity of Panel opinion on whether EPA should use negative and zero values in calculating EEMs.
 - o *Lead Discussants:* Drs. Embertson, Meyer, and Sampson

Draft EPA Lagoon Report

- 1) EPA should not combine the Swine Lagoon data with the Dairy Lagoon data.
 - o *Lead Discussants:* Drs. Embertson, Leytem, Meyer, Aneja, and Faulkner
- 2) Provide scientific basis for model selection (RPM vs. bLS model).
 - o *Lead Discussants:* Drs. Leytem, Maghirang, Faulkner, and Rotz

- 3) Develop a process-based modeling approach to make predictions of air emissions from dairy and swine lagoons.
 - o *Lead Discussants:* Drs. Meyer and Zhao
- 4) Data completeness, representativeness, and limitations.
 - o *Lead Discussants:* Drs. Kohn, Aneja, and Faulkner

Public Comments

Mr. Hanlon noted that the Panel received no requests from the public to register and submit oral public comments. Dr. Allen then stated that the Panel would begin the discussion on EPA's response to Panel member questions.

Discussion on Whether EPA's Additional Data Changes the Panel's Preliminary Key Issues and Panel Recommendations from March 2012 Panel Meeting

Draft EPA Broiler Report

A) Develop a process-based modeling approach

The Panel discussed its preliminary recommendation from the March 2012 meeting that EPA develop a process-based modeling approach to make predictions of air emissions on Broiler farms. The Panel also discussed whether EPA's additional data changes any of the Panel's preliminary responses regarding this preliminary recommendation, and whether there is enough data currently available to develop a process-based Broiler model to calculate EEMs.

The Panel noted that EPA's supplemental response did not change the Panel's overall preliminary response regarding this preliminary recommendation, and noted sufficient data may currently be available to begin to develop a process-based Broiler model for some but not all key parameters needed to calculate EEMs. The Panel strongly recommended that EPA soon develop process-based models, and identify critical data gaps in such models. The Panel also recommended that EPA begin the process for identifying which key parameters should be included within the process-based models. The Panel noted that while it is not the Panel's responsibility to develop a process-based model for EPA, the Panel planned to recommend a variety of potential approaches for developing process-based models (including models that may be available in literature), and would try to identify parameters that should be considered within process-based modeling approaches and issues with such recommendations.

One Panel member noted that Table 4-4 of EPA's draft Broiler report provided a significant amount of information that could be used to support development of a process-based model. The member noted that the National Air Emissions Monitoring Study (NAEMS) does not provide sufficient data to produce a full model, but was sufficient to start the process to produce a full model. Another member noted that the NAEMS data does not reflect the amount and location of Broiler industry data. This member noted that the additional data that EPA provided in July and August 2012 included data on total nitrogen and other parameters that will aid in the development of a process-based model. The member recommended that EPA begin developing a process-based model as soon as possible, and compare results of such a model with results from EPA's statistical model that assesses EEMs that was presented in EPA's draft Broiler report.

Another Panel member stated that a process-based model could be developed for ammonia, hydrogen sulfide and gases, because the mechanisms for generating these gases are understood. The member noted there may not be a good basis for developing a process-based model for particulates since the mechanisms for generating particulates were not well understood.

One Panel member commented that feed intake data does not appear to be available, noting that while EPA has sufficient data to develop a full process-based model for the steps from manure generation to emissions, EPA does not have sufficient data to develop a full process-based model for the steps from feed development to manure generation. Another Panel member commented that EPA's use of regression data seemed inappropriate in certain instances since there were potential biases in the regression data.

One Panel member noted that data needs for developing a process-based model are less than data needs for developing a statistical model, and that a process-based model is based on science and not solely on data. Another Panel member commented that since EPA recently received additional, supplemental data for its analyses, EPA should reassess whether such data would change its approach and parameters used in its statistical approach (e.g., EPA could review the supplemental litter nitrogen data and potentially use that variable in its statistical model to develop a more widely applicable model).

B) Improve EPA's statistical approach to developing EEMs

The Panel discussed its preliminary recommendation from the March 2012 meeting that EPA improve its statistical approach for developing EEMs to make predictions of air emissions on Broiler farms and for swine and dairy lagoons and ponds. The Panel noted that while EPA's supplemental data response clarified several questions raised by Panel members, EPA's supplemental response did not change the Panel's overall response regarding this preliminary recommendation.

A Panel member noted that EPA's July 2012 response helped clarify how EPA analyzed the data used to develop the EEMs (e.g., in response to the Panel's request for graphical analyses, EPA clarified that graphical analyses were not conducted). Another Panel member expressed concern that EPA did not address certain questions raised by the Panel. For example, EPA did not discuss or provide further clarification regarding the Panel's primary concern regarding the limited data used to calculate EEMs (e.g., three farms were used to calculate broiler EEMs).

A Panel member noted that EPA could use a process-based modeling approach to satisfy extreme values and fit data rather than use statistically-generated extrapolations for parameters outside the bounds of measured values.

C) Broiler VOC data do not support generating a broiler VOC EEM

The Panel discussed its preliminary recommendation from the March 2012 meeting that Broiler VOC data do not support generating a Broiler VOC EEM at this time. The Panel noted that while EPA's supplemental data response helped to clarify several questions raised by Panel members, EPA's supplemental response did not change the Panel's overall preliminary response regarding this preliminary recommendation.

Several Panel members noted that some VOC data are useful, particularly the speciated VOC data provided on pages 48 and 49 of EPA's July 2012 supplemental data report. These Panel

members noted that it would likely take EPA several years to gather sufficient data to develop an acceptable VOC EEM. Another Panel member noted that various aldehydes and ketones in the reported VOC data create very challenging analytical issues.

D) Zero and Negative data values

The Panel discussed its preliminary recommendation from the March 2012 meeting that negative values are important, and that not including such values institutes a positive bias in the development of Broiler EEMs. The Panel commented that while EPA provided some responses to the questions that the Panel raised, EPA's supplemental response did not change the Panel's overall preliminary response regarding its recommendations regarding the use of zero and negative data values in developing Broiler EEMs.

One Panel member commented that EPA's supplemental response helped describe how the issue arose, but did not explain why EPA did not reanalyze the broiler data. Another Panel member noted that EPA's response did not clarify the reasons for EPA took different approaches for use of negative values at different sites. One member noted that EPA did not discuss how background levels and other site-specific data may have affected the decisions on whether to use or not use the negative values.

One Panel member stated that EPA did not test outliers nor comprehensively discuss background samples or the appropriateness of using negative values. The member commented that EPA did not discuss certain key issues on this topic (e.g., differences between EPA and Tyson site values, and why zero values were not included).

Another member noted that Dr. Al Heber stated at the March 2012 Panel meeting that he adjusted data if negative values were indicated during data calibration. The Panel member commented that this seemed inappropriate and was unclear whether such an approach followed the expectations for instrument use developed by the manufacturer of the analytical device.

Draft EPA Lagoon Report

A) EPA should not combine the Swine Lagoon data with the Dairy Lagoon data

The Panel discussed its preliminary recommendation from the March 2012 meeting that EPA should not combine the Swine Lagoon data with the Dairy Lagoon data. The Panel noted that EPA gave no reasons or additional data on why this data should be combined, and stated that EPA's supplemental response did not change the Panel's overall preliminary response regarding this preliminary recommendation.

A Panel member stated that there are significant concerns in comparing dairy to dairy data. Another Panel member expressed significant concern that EPA's limited swine and dairy data does not adequately represent the industry, noting that three of EPA's dairy and swine scenarios utilized data from only one site. The Panel member recommended that EPA use chemistry and surface area information to assist in defining the scenarios.

B) Develop a process-based modeling approach to make predictions of air emissions from dairy and swine lagoons.

The Panel preliminarily recommended that EPA develop a process-based modeling approach to assess swine lagoon and dairy lagoon data, and incorporate biological, chemical, and physical components into that approach. The Panel noted that EPA's supplemental response did not change the Panel's overall preliminary response regarding this preliminary recommendation.

A Panel member commented that literature sources could potentially be used and verified against NAEMS data to help develop a process-based modeling approach. The Panel member noted that current NAEMS data are limited, especially data on the input into lagoons, the composition of lagoons, and feed data. Another Panel member noted that since the NAEMS lagoon data collection effort did not systematically collect data on various physical parameters (e.g., surface area exposed, sidewall angle/dimensions, and characteristics of materials entering the lagoons), it is difficult to assess lagoon input and output data.

One Panel member noted that Dr. Heber indicated at the March 2012 meeting that mass balance data was available as part of the NAEMS data collection effort. This Panel member commented that if this mass balance data was available for all collected parameters and variables, that data should be included in EPA's report.

C) Provide scientific basis for model selection (RPM vs. bLS)

The Panel preliminarily recommended that EPA provide the scientific basis for model selection (RPM vs. bLS), and noted that EPA's supplemental response did not provide additional information on why EPA did not use bLS data in its analysis. The Panel commented that EPA provided useful information describing how much data was excluded, and noted that EPA's supplemental response did not change the Panel's overall preliminary response regarding this preliminary recommendation.

D) Data completeness, representativeness, and limitations

The Panel discussed various preliminary concerns regarding data completeness, representativeness, and limitations, and the use or exclusion of zero and negative data associated with EPA's EEMs for Broiler farms and for swine and dairy lagoons and ponds. The Panel noted that EPA's response provided useful information, but commented that EPA's supplemental response did not sufficiently provide reasons for why certain data were excluded, and the response did not change the Panel's overall preliminary response regarding its preliminary concerns regarding these data issues. The Panel commented that there are some key missing data, and will deliberate on whether EPA should collect more or reanalyze existing data, and whether data could be salvaged. The Panel noted it would also consider whether there are sufficient data to begin a process-based modeling approach.

Several Panel members recommended that EPA more fully explain why any data were excluded from its EEM development. One Panel member expressed concern that EPA may have excluded sampling data if such data were not collected for at least 18 hours per day. Another Panel member suggested that if data were not collected at night, EPA should not discard all data for the day; rather, EPA could develop a calculation to estimate the data during the missing timeframe.

Several Panel members noted that EPA may have systematically excluded data that have low or negative actual values, or were not collected because equipment malfunctioned due to environmental conditions, and that such exclusion may bias the results. Another Panel member suggested that EPA could potentially prepare two analyses - one that includes and one that

excludes data, and discuss reasons for differences between the two results and whether there are biases or random error changes in the data.

Several Panel members noted that EPA should provide information on data availability issues associated with model selection (RPM vs. bLS model). One Panel member noted that since it is unclear what are the true emissions for a particular farm, it is unclear which method is under or over-estimating emissions.

One Panel member commented that EPA should consider use of 'outside' data that was not collected as part of the NAEMS data collection effort. The member also noted that Dr. Heber incorporated negative and zero values into his analysis, and commented that the SAB Panel has not reviewed this analysis in comparison to EPA's analysis. Another member requested that EPA clarify whether upstream samples and modeling results differed from downstream samples and modeling results for the sampling sites.

Dr. Allen asked if any Panel members had any additional comments on this topic. Hearing none, he asked that any Panel member to raise any comments on any of EPA's July and August, 2012 responses to the Panel's specific requests for data, again with a focus towards whether EPA's additional data adjusted any of the Panel's preliminary responses as discussed at the March SAB Panel meeting. No Panel members raised any comments on this topic.

Discussion on the Panel's Preliminary Responses to Charge Questions

Dr. Allen then summarized the Panel's preliminary responses to the charge questions, as discussed at the Panel's March meeting, with a focus on whether EPA's additional data changes any of the Panel's preliminary responses to the charge questions.

Charge Question 1: Dr. Allen summarized the Panel's preliminary response, noting that the Panel had a number of preliminary suggestions for improving the statistical approach used by the EPA for developing the draft EEMs for broiler confinement houses and swine and dairy lagoons/basins. He also noted that the Panel suggested that EPA should develop a process-based modeling approach to make predictions of air emissions on farms. Dr. Allen asked if EPA's July and August 2012 supplemental responses changed the Panel's preliminary responses to this charge question; no members of the Panel responded in the affirmative.

Charge Question 2: Dr. Allen summarized the Panel's preliminary response, noting that EPA should not combine the swine and dairy dataset, and should not combine lagoon and basin data. Dr. Allen asked if EPA's July and August 2012 supplemental responses changed the Panel's preliminary responses to this charge question; no members of the Panel responded in the affirmative.

Charge Question 3: Dr. Allen summarized the Panel's preliminary response, noting there are significant flaws in the static predictor variables provided by EPA in the Reports and that EPA should develop a variable predictor for loading into the lagoons. Dr. Allen asked if EPA's July and August 2012 supplemental responses changed the Panel's preliminary responses to this charge question; no members of the Panel responded in the affirmative.

Charge Question 4: Dr. Allen summarized the Panel's preliminary response, noting that EPA should consider alternative approaches for developing the draft NH₃ EEM, including approaches that estimate emissions in terms of mass of pollutant per unit mass of litter removed. Dr. Allen

asked if EPA's July and August 2012 supplemental responses changed the Panel's preliminary responses to this charge question; no members of the Panel responded in the affirmative.

Charge Questions 5 and 6: Dr. Allen summarized the Panel's preliminary response, noting there was a diversity of Panel opinion on whether EPA should use negative and zero values in calculating EEMs. Dr. Allen asked if EPA's July and August 2012 supplemental responses changed the Panel's preliminary responses to this charge question; no members of the Panel responded in the affirmative.

Charge Question 7: Dr. Allen summarized the Panel's preliminary response, noting that Broiler VOC data do not support generating a broiler VOC EEM at this time. Dr. Allen asked if EPA's July and August 2012 supplemental responses changed the Panel's preliminary responses to this charge question; no members of the Panel responded in the affirmative.

Next Steps and Action Items:

Mr. Hanlon noted that by August 15th, 2012, individual Panel Members should identify their preferences for serving on a subgroup that will write the Panel's initial draft response to each charge question. He noted that Panel writing assignments would be sent out by Thursday August 16th to the Panel. By September 14th, each subgroup should send Mr. Hanlon their draft response to each charge question. By September 28th, a draft Report would be sent for Panel review. The draft report will include a cover letter, an executive summary, and the body of the report which will include a detailed response to each charge question. The draft report would be placed on the October 24, 2012 SAB Teleconference website. During the October 24th Panel teleconference, next steps would be further discussed.

Dr. Allen asked if the Panel members had any additional questions or comments. Hearing none, Dr. Allen thanked the Panel members and EPA staff who participated during the teleconference. With the meeting business concluded, the Designated Federal Officer adjourned the teleconference at 3:30 pm ET.

Respectfully Submitted:

/signed/

Mr. Edward Hanlon
Designated Federal Officer

Certified as Accurate:

/signed/

Dr. David T. Allen, Chair
SAB Animal Feeding Operations Air
Emissions Review Panel

NOTE AND DISCLAIMER: The minutes of this public teleconference reflect diverse ideas and suggestions offered by Panel members during the course of deliberations within the teleconference. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from the Panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters or reports prepared and transmitted to the EPA Administrator following the public meetings or teleconferences.

Materials Cited

The following teleconference materials are available on the SAB website (www.epa.gov/sab) or through the following SAB Animal Feeding Operations Air Emissions Review Panel August 13, 2012 teleconference website:

<http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/5f2a619e899c86cf85257a320040ec55!OpenDocument&Date=2012-08-13>

¹ Agenda for August 13, 2012 public teleconference

² Federal Register Notice announcing the public teleconference

³ “Development of Emissions Estimating Methodologies for Broiler Animal Feeding Operations”
February 2012 draft

⁴ “Development of Emissions Estimating Methodologies for Lagoons and Basins at Swine and Dairy Animal Feeding Operations” February 2012 draft

⁵ Updated Preliminary Response to Charge Questions, Report Sections and Data Needs-SAB Animal Feeding Operations Emissions Review Panel-April 5, 2012

⁶ Additional Data for SAB Review: EPA’s Emissions Estimating Methodologies for Animal Feeding Operations for Broiler Sector and for Swine and Dairy Lagoons and Basins - July 2, 2012

⁷ Additional Supplemental Data in response to Question 3.2.1. as outlined in EPA's July 2, 2012 response document entitled “Additional Data for SAB Review: EPA’s Emissions Estimating Methodologies for Animal Feeding Operations for Broiler Sector and for Swine and Dairy Lagoons and Basins” – August 8, 2012

⁸ Public Comments submitted by Jean Public – July 23, 2012

ATTACHMENT A – ROSTER

U.S. Environmental Protection Agency Science Advisory Board Animal Feeding Operations Emission Review Panel

CHAIR

Dr. David T. Allen (Chair), Professor, Department of Chemical Engineering, University of Texas, Austin, TX

MEMBERS

Dr. Viney Aneja, Professor, Department of Marine, Earth, and Atmospheric Sciences, North Carolina State University, Raleigh, NC

Dr. Brent Auvermann, Professor of Biological and Agricultural Engineering, Texas AgriLife Extension Service, Amarillo, TX

Dr. Peter Bloomfield, Professor, Statistics Department, North Carolina State University, Raleigh, NC

Dr. Alicia Carriquiry, Distinguished Professor and Associate Chair, Statistics Department, Iowa State University, Ames, IA

Dr. Nichole Embertson, Nutrient Management and Air Quality Specialist, Whatcom Conservation District, Lynden, WA

Dr. William Brock Faulkner, Assistant Professor, Department of Biological and Agricultural Engineering, Texas A&M University, College Station, TX

Dr. Robert Hagevoort, Assistant Professor and Extension Dairy Specialist, New Mexico State University Agricultural Science Center, Clovis, NM

Dr. Richard Kohn, Professor, Animal and Avian Sciences Department, University of Maryland, College Park, MD

Dr. April Leytem, Research Soil Scientist, Northwest Irrigation and Soils Research Laboratory, U.S. Department of Agriculture-Agricultural Research Service, Kimberly, Idaho

Dr. Ronaldo Maghirang, Professor, Biological and Agricultural Engineering Department, Kansas State University, Manhattan, KS

Dr. Deanne Meyer, Livestock Waste Management Specialist, Department of Animal Science, University of California, Davis, Davis, CA

Dr. Wendy Powers-Schilling, Director of the Institute for Agriculture and Agribusiness, Director of Environmental Stewardship for Animal Agriculture, and Professor in the Departments of Animal Science and Biosystems and Agriculture Engineering, Michigan State University, East Lansing, MI

Dr. C. Alan Rotz, Agricultural Engineer, Pasture Systems and Watershed Management Research Unit, U.S. Department of Agriculture-Agriculture Research Service, University Park, PA

Dr. Paul D. Sampson, Research Professor and Director of Statistical Consulting Programs, Department of Statistics, University of Washington, Seattle, WA

Dr. Eric P. Smith, Professor and Head, Department of Statistics, Virginia Polytechnic Institute and State University, Blacksburg, VA

Dr. John Smith, Dairy Specialist and Professor, Department of Animal Sciences, The University of Arizona, Tucson, AZ

Dr. Eileen Wheeler, Professor, Department of Agricultural and Biological Engineering, The Pennsylvania State University, University Park, PA

Dr. Lingying Zhao, Associate Professor, Department of Food, Agricultural and Biological Engineering, The Ohio State University, Columbus, OH

SCIENCE ADVISORY BOARD STAFF

Mr. Edward Hanlon, Designated Federal Officer, U.S. Environmental Protection Agency, Washington, DC

ATTACHMENT B – Public Attendance

List of Members of the Public Who Participated or Requested Information for Calling into the Public Teleconference Call is Provided Below:

August 13, 2012

Name	Affiliation
Beasley, Lynn	EPA
Benedict, Kristen	EPA
Berezinicki, Sarah D	EPA
Deitrich, Casey	CQ Transcriptions
Dunkins, Robin	EPA
Elmore, Larry	EPA
Ewing, Jamie L.	State of Arkansas Department of Environmental Quality
Heinzen, Tarah	Environmental Integrity Project
Hopkinson, Jenny	Inside EPA
Howland, Sanda	EPA
Igoe, Shelia	EPA
Koster, Robert	WA Dept. of Ecology
Koster, Robert	State of Washington Department of Ecology
Lado, Marianne Engelman	Earthjustice
Liang, Yi	University of Arkansas
Lim, Teng Teeh	University of Missouri
Mayer, Ally	EPA
McDonald, Ashley Lyon	National Cattlemen's Beef Association
Merrill, Ray	EPA
Miller, Joseph A.	Rose Acre Farms
Myers, Ron	EPA
Nail, Amy	HONESTat
Norman, Ramon	San Joaquin Valley Air Pollution Control District
Park. Mi Young	State of Oregon Department of Environmental Quality

Name	Affiliation
Public, Jean	Member of Public
Ridgway, Robin M.	Purdue University
Royden-Bloom, Amy	National Association for Clean Air Agencies
Rudek, Joe	Environmental Defense Fund
Saunders, Gary	North Carolina Department of Agricultural Quality
Shaver, Sally L.	Shaver Consulting, Inc.
Shores, Richard	EPA
Sullivan, Tim	EPA
Thompson, Rhonda	EPA
Wagner, Richard	American Foods Group
Walmsley, Andrew	American Farm Bureau Federation
Weinheimer, Ben	Texas Cattle Feeders Association
Wilson, Linda M.	New York State Office of the Attorney General