Official Comments and Recommendations from

the USDA Agricultural Air Quality Task Force

EPA Reactive Nitrogen Report

December, 2013

AAQTF COMMENTS ON THE INTEGRATED NITROGEN COMMITTEE REPORT, REACTIVE NITROGEN IN THE UNITED STATES: AN ANALYSIS OF INPUTS, FLOWS, CONSEQUENCES, AND MANAGEMENT OPTIONS

On February 7, 2012, the AAQTF heard a presentation by Dr. Otto Doering of Purdue University on the results of the EPA's Science Advisory Board's Integrated Nitrogen Committee (INC). The report, *Reactive Nitrogen in the United States: An Analysis of Inputs, Flows, Consequences, and Management Options* includes numerous recommendations by the panel to address reactive nitrogen. The AAQTF also discussed this report and previous AAQTF actions with regard to the INC report at its December, 2013 meeting in Beltsville, MD, and again endorsed the following comments. The AAQTF recognizes the concerns about excess reactive nitrogen in the environment; however, we also recognize the critical role of reactive nitrogen in supporting plant and animal life. It will be most challenging to determine what is "excess" and to define the "excess reactive nitrogen" as the pollutant of concern and not "reactive nitrogen."

AAQTF COMMENTS ON KEY OVERARCHING RECOMMENDATIONS:

1. In general the AAQTF supports the overarching recommendations of the Integrated Nitrogen Committee's report, *Reactive Nitrogen in the United States: An Analysis of Inputs, Flows, Consequences, and Management Options,* as presented by Chair, Otto Doering, Purdue University, at its meeting in Phoenix, AZ on February 7, 2012. These four recommendations from the Integrated Nitrogen Committee to EPA are as follows:

    - *The nitrogen cascade should be used as a framework to understand the environmental impacts of reactive nitrogen as it moves through multiple ecosystems and media.*
    - *Integrated cross-media management approaches and regulatory structures are needed to recognize tradeoffs and focus management efforts at points of the nitrogen cascade where they are most efficient and cost effective.*
    - *EPA should form an intra-Agency Nr management task force to build on the existing breadth of Nr research and management capabilities within the Agency.*
    - *EPA should convene an inter-Agency Nr management task force to coordinate federal programs that address Nr monitoring, modeling, research, and management.*

2. The AAQTF recognizes the concerns about excess reactive nitrogen and its impact on our environment. However, the AAQTF also recognizes that nitrogen is necessary for life and that it is the excess of nitrogen releases to the environment which create the concern. Therefore, we urge EPA to implement the above recommendations prior to addressing any of the specific recommendations from this panel as outlined in its final report. The cross-media management approaches which the Panel recommends should be a primary goal of EPA as it moves forward. Where this cross-media approach is limited by the current statutes, the EPA should be proactive in its efforts to remove these barriers. Farmers cannot to be and should not be subjected to conflicting and redundant regulatory and non-regulatory programs which address the same practice.

   The AAQTF recognizes the challenge faced by the farmers of the world in meeting the food, fiber, and fuel needs of 9 billion people by 2050. Increased yields from existing farmland are imperative if this challenge is to be met. Therefore, any policies, regulations and incentive programs to address excess reactive nitrogen must factor this challenge into its approach as a top priority. Unfortunately, the current statutory authorities of the EPA may limit the consideration of this priority if EPA pursues certain of the panel's recommendations.

3. The AAQTF has concerns with the following recommendations of the INC. (The information in italics represents the recommendations of the INC).
   - *EPA should consider a range of Nr risk management options including:*
     - *An evaluation of the full suite of regulatory and non-regulatory tools used to manage Nr to determine the most effective mechanisms to apply to each source.*
     - *A policy, regulatory, and incentive framework to further limit the transport of applied nutrients off farms.*

     Concern: The AAQTF has significant concerns about any prescriptive regulatory approach to non-point sources and emissions from farm operations. In most, if not all, of the EPA regulatory programs permitting is involved which is very costly, resource intensive, and requires significant monitoring and reporting. Additionally, under the current statues, a prescriptive regulatory approach includes severe monetary penalties. To adopt a regulatory approach to these types of agricultural sources without extensive research, monitoring, and collaborative dialogue with farmers could seriously harm agricultural outputs. Farm management practices have evolved substantially in recent years, and specifically address the concern for excessive releases of reactive nitrogen. It makes little sense to develop a burdensome and prescriptive regulatory or permitting program for actions that farmers are going to take anyhow in response to economic and production stimuli

- *EPA should undertake education, communication, and outreach to build public support for addressing the widespread problem of Nr.*

  Concern: The AAQTF agrees that education, communication and outreach regarding the problem of reactive nitrogen are needed. However, this effort should not be undertaken by EPA alone and without the significant input and partnering with the USDA. In addition to the "widespread problem of Nr," this education and communication must include the benefits of reactive nitrogen. The education and communication must focus on the "widespread problem of *excess* Nr" and should include all sources, including agricultural, industrial and urban.

4. The AAQTF agrees with the panel that:

   - *Additional Nr research and monitoring are essential to:*

     - *Reduce the margins of error in our current understanding of environmental Nr concentrations or flows.*
     - *Target actions to reduce excess Nr and understand the efficacy of management actions that have been taken.*
     - *Improve our understanding of the indirect impacts of Nr and the indirect impacts of measures to control Nr.*

5. Although the AAQTF does not necessarily agree with the numerical estimates of the SAB, we do agree that progress in reducing excess reactive nitrogen can be accomplished using existing technology in the next 10-20 years. We are aware of current EPA efforts to reduce emissions from mobile sources and power plants. Crop uptake efficiencies are being improved and we would encourage EPA and USDA support of technologies that continue this upward trend. Best management practices at livestock and poultry production operations are being implemented at increasing rates. We support the current approaches of voluntary and incentive-based efforts to accomplish these reductions and do not support an extension of EPA regulatory programs.

AAQTF COMMENTS ON KEY AIR QUALITY RECOMMENDATIONS

1. The AAQTF does have great concern about the following recommendation (in italics) of the panel.
   - *Reexamination of the criteria air pollutant "oxides of nitrogen" to consider whether it should be supplemented with other indicators of chemically reactive nitrogen.*

Concern: As currently constructed the Clean Air Act does not allow the EPA to consider costs when establishing its health and welfare national ambient air quality standards. The AAQTF believes that EPA should move to consider food production (yields) a factor which can be considered when determining the health and welfare effects of reactive nitrogen. Further, the non-attainment designations and implementation strategies which have been utilized to date have not been well suited to agricultural sources. Once a standard for a NAAQS is established, the EPA has limited flexibility in its implementation of that standard. Therefore, we would strongly oppose the addition of other indicators of chemically reactive nitrogen without prior statutory changes which would assure appropriate consideration of food production and agricultural emissions sources. To this end, we encourage EPA to develop a more holistic risk-based system when making these determinations.

2. The AAQTF has great concern about the management of excess reactive nitrogen being under the sole authority of EPA. Since the impact of any regulation of excess reactive nitrogen will impact the nation's production of food, fiber, and fuel, clearly the USDA must have a significant leadership and decision-making role in the management of excess reactive nitrogen from agricultural sources.
3. The AAQTF has concerns about the following recommendations (in italics) of the INC;
   - *Expand NO_x control efforts for emissions of mobile sources and power plants*.

     Concern: The AAQTF has significant concerns about the impact of NOx control efforts for non-road mobile sources. The impact of NOx regulations in CA has caused farmers to replace over 6,100 diesel irrigation pump engines. Additionally, the California Air Resources Board has implemented a diesel truck replacement program and is now embarking on developing an off-road rule that will require replacement of the farm vehicle fleet; tractors, forage harvesters, combines, orchard sweepers and other diesel powered equipment. Additionally, the development of manure digesters to produce electricity has been stifled in California due to the need to install expensive after-market equipment to control NOx emissions. These examples further indicate that a holistic risk-based approach that considers all factors is necessary.

   - *Encourage states to address NH_3 as a harmful $PM_{2.5}$ precursor.*

     Concern: The AAQTF supports the current treatment of NH_3 in EPA's regulation of $PM_{2.5}$. Modeling has demonstrated that the control of ammonia emissions in some areas does not contribute to attainment of the standard. Further, EPA has provided states with the option to demonstrate that ammonia contributes to $PM_{2.5}$ nonattainment. If demonstrated, then the state may regulate ammonia as a precursor.

     In the San Joaquin Valley, research and monitoring have shown that some of the management practices at dairies that reduce VOC emissions have a collateral benefit of

reducing ammonia emissions. Thus, regulating ammonia as a precursor in some cases could result in only additional paperwork with no additional environmental benefit.

AAQTF COMMENTS ON KEY WATER QUALITY RECOMMENDATIONS

1. The AAQTF has great concern about the following recommendations (in italics)of the panel:

   - *Develop a uniform Nr assessment and management framework that considers loading over a range of scales, and includes all inputs related to atmospheric and riverine delivery to estuaries and their effects on eutrophication dynamics.*

   - *Set Nr management goals on a regional/local basis.*

     Concern: The AAQTF has concerns about EPA's establishing these Nr goals especially if the approach used in the Chesapeake Bay is followed. Questions remain about the accuracy of the models especially for agricultural sources and the measures which are being imposed on the agricultural community in the watershed. The allocation of credit for agricultural best management practices has been most challenging indicating that much more research and data are needed prior to undertaking such approaches in other large-scale watersheds. These goals should be developed in conjunction with USDA, state and local partners, including the farming community and in a collaborative process, rather than issuing prescriptive rules.

   - *Address Nr runoff and discharges by reviewing current regulatory and nonregulatory programs and tools to determine adequacy and capacity to meet Nr management goals.*

   - *Determine and apply the most effective regulatory and voluntary mechanisms to each Nr source type, paying special attention to the need to control nonpoint sources.*

     Concern: The AAQTF has significant concerns about any regulatory approach to non-point sources from farm operations. In most if not all of the EPA regulatory programs, permitting is involved which is very costly, resource intensive, and requires significant monitoring and reporting. Additionally, under the current statues, a regulatory approach includes severe monetary penalties. To adopt a regulatory approach, especially one that is prescriptive rather than collaborative, to these types of agricultural sources without extensive research, monitoring, and dialogue with farmers could seriously harm agricultural outputs and be a disincentive to the adoption of innovative agricultural practices. EPA should note that farmers do not farm today as they did yesterday and will not farm tomorrow as they do today. One size fits all style requirements should be avoided so that practices may naturally evolve in consideration of all the needs expected of agriculture; air and water quality protection, adequate food production and food costs, and greenhouse gas reductions. In short, future EPA efforts must avoid regulatory silos and become more holistic in development.

- *Encourage wetland restoration and creation to promote denitrification*.

AAQTF COMMENTS ON KEY DATA ACQUISITION RECOMMENDATIONS

1. In general, the AAQTF supports the following recommendations (in italics) of the INC.
   - *Obtain more and better data to inform management decision-making*
     - *In partnership with other agencies, routinely and consistently account for presence of Nr in the environment using an integrated approach to monitoring that includes air, water, and land components.*
     - *Expand scope and spatial coverage of atmospheric Nr concentration and flux monitoring networks (e.g., National Atmospheric Deposition program, Clean Air Status and Trends Network).*
     - *Obtain better fertilizer application data for major crops and residential turf.*
     - *Monitor gas and particulate matter emissions from agriculture.*
     - *Begin air monitoring of NH_x and NO_y to supplement the existing network of NO_2 compliance monitors.*

AAQTF COMMENTS ON KEY RESEARCH RECOMMENDATIONS

1. In general, the AAQTF supports the following recommendations (in italics) of the INC.
   - *Management Strategies Research*
     - *Understanding tradeoffs associated with management strategies for carbon, Nr and other contaminants.*
     - *Understanding the combined impacts of different Nitrogen management strategies on the movement of Nr across environmental media.*
     - *Understanding the effectiveness of best management practices (particularly for controlling Nr from nonpoint and stormwater sources).*
     - *Understanding how to manage the impact of Nr on ecosystem services.*
   - *Agricultural research*
     - *Understanding and predicting how agricultural biofuel production technologies and methodologies will affect Nr inputs and outputs from agriculture and livestock systems.*

- *Increasing gain in crop yields and Nitrogen Fertilizer use Efficiency.*
- *Understanding nitrogen mass balance for crop agriculture.*
- *Improving fertilizer application and formulation technologies.*

- *Nitrogen Budget Research*
  - *Quantifying the N budgets of terrestrial systems and the magnitudes of major loss vectors.*
  - *Quantifying denitrification in soils and aquatic systems.*
- *Measurement and Modeling Research*
  - *Improving analytical techniques for measuring atmospheric NO_y and NH_x and modeling the movement of Nr in the environment.*
  - *Cross-disciplinary research to model interactions of climate and Nr.*

AAQTF SUMMARY RECOMMENDATIONS

The Agricultural Air Quality Task Force suggests the following basic principles as EPA works to develop a policy for reactive nitrogen:

A. Keep the Scientific Advisory Board closely involved in the process.

B. Fully engage with USDA and agricultural production groups.

C. Recognize and implement a regional perspective.

D. Scientific basis is inadequate at this time to designate ammonia as a criteria pollutant.