Preliminary Comments from Members of the Clean Air Scientific Advisory Committee (CASAC) Air Monitoring and Methods Subcommittee (AMMS)
Preliminary Comments received on 2/15/11
In Preparation for Public Meeting, February 16, 2011

Carolina Inn, 211 Pittsboro Street, Chapel Hill, NC, 27516 (919-933-2001)

Purpose: To review and provide advice on the scientific adequacy and appropriateness of EPA draft documents on monitoring and methods for Oxides of Nitrogen (NOx) and Sulfur (SOx).

Preliminary Comments from Dr. Jay Turner

CASAC Review of Monitoring Options for NOx/SOx Secondary NAAQS
Preliminary Comments in Response to the Charge Questions
(January 27, 2011 Memorandum)

Jay R. Turner
February 15, 2011

I applaud the Agency for taking a holistic, multimedia approach that includes a form of the standard grounded in a water quality metrics with ambient air concentrations as indicators that are inputs to the calculation of the water quality metric. This also provides a challenge in responding to the charge questions in that it is not clear what MQOs/DQOs are appropriate for the ambient air measurements. This general comment is reflected in the cursory preliminary responses provided below. In most cases, it is difficult to assess whether a given measurement method is appropriate in the absence of information about concentration ranges of interest, desired precision and accuracy, and so on.

1. What are the panel's views on using the CASTNET filter pack (FP) to measure particulate sulfate for the purpose of providing annual average values as an indicator for the NOx/SOx standard? Given EPA plans primarily to document the capability of the CASTNET FP and develop the FRM for particulate sulfate based on the existing information and procedures, what are the panel's views of this approach for setting the FRM?

As noted in the background documents, the CASTNET filter has the advantage of being an open sampler that will collect particles larger than 2.5 ï□-m. While most of the sulfate is expected to be in the fine fraction, in many cases there will be some sulfate mass in the supermicron fraction and these particles would have high deposition

velocities. The goal of capturing the sulfate mass of these particles is understood, but assumptions would still need to be made about the particle size distributions and in the absence of such site-specific information it is not clear to me that the open sampler design brings added value. That said, the CASTET filter pack might be an appropriate FRM pending the outcomes of the planned effort to document the samplerâ€™s capability and a clearer articulation of the measurement quality objectives.

2. What are the panel's views on using the CASTNET filter pack (FP) to measure sulfur dioxide gas for the purpose of providing annual average values as an indicator for the NOx/SOx standard? If EPA would document the capability of the CASTNET FP and develops an FRM for sulfur dioxide gas based on the existing information and procedures, what are the panel's views of this approach for setting the FRM?

Again, the key issue is whether the CASTNET FP meets the data quality objectives which have not yet been defined. The provided background documents mentioned that the CASTNET measurements are generally accepted to be high quality, but this is a subjective statement. What data are available to compare the CASTNET filter pack SO2 to other measurement methods? CASTNET includes two collocated sites; what information is available about the collocated precision?

3. What are the panel's views on using the current primary FRM (high time resolution UVF) to measure sulfur dioxide gas for the purpose of providing annual average values as an indicator for the NOx/SOx standard?

The ultraviolet fluorescence (UVF) method is an FRM for the current primary SO2 NAAQS. As such it has been deemed acceptable for compliance monitoring for a 0.030 ppmv annual average standard. Performance specifications candidate reference and equivalent methods are documented in 75 FR 35597- 35601. In the context of the secondary standard monitoring objectives is likely that the detection limit of 1 ppbv would be acceptable. Maximum interference shall be less than Â±5 ppbv SO2 equivalent, and 12- and 24-hour zero drift less than Â±5 ppbv SO2 equivalent. Presumably these metrics are also acceptable but in the absence of guidance on the anticipated mixing ratios that would be relevant, a recommendation is premature.

4. What are the panel's views on using existing NOy methods that are deployed, for example, in NCore as the measurement approach for NOy for the purpose of providing annual average values as an indicator for the NOx/SOx standard? What are the panelâ€™s views on EPAâ€™s assessment that additional study is needed before establishing an FRM based on the existing NOy methods? That is, are the methods already adequately demonstrated as a reference method to determine compliance with a NAAQS? What are the panelâ€™s views on the research plan for establishing existing NOy methods as an FRM? [Note suggested improvement to the plan would be appreciated, particularly ones that would help complete the study on time.]

I have no preliminary comments on this charge question.

5. What are the panel's views on using the CASTNET filter pack (FP) to measure total nitrate for the purpose of providing annual average values as a surrogate indicator for the NOx/SOx standard? If EPA would document the capability of the CASTNET FP and develops an FRM for total nitrate based on the existing information and procedures, what are the Panelâ€™s views of this approach for setting the FRM?

See comments for sulfate above, #1.

6. What are the panel's views on using the emerging AMoN ammonia monitoring network that uses passive sampling technology as a tool for evaluating air quality model behavior with respect to characterizing ambient air patterns of ammonia?

Some information is available on the data quality from the AMoN ammonia monitoring network.1 Measurements were conducted using RadielloÂ® passive samplers. Triplicate samplers were used to determine precision and URG denuders were used to determine relative accuracy. These data should be packaged and disseminated to provide insights into the measurement data quality.

7. What are the panel's views on co-locating ammonia measurements at each location where the indictors are measured?

This would have added value and, presuming the passive sampling approach is deemed to have acceptable data quality, it would require a low level of effort for field operations.

8. What are the panel's views on using the CASTNET filter pack (FP) to measure ammonium ion as a tool for evaluating air quality model behavior with respect to characterizing ambient air patterns of ammonia?

See comments for sulfate above, #1.

9. What are the panel's views on establishing a suite of NOy species measurements at 2- 5 locations in different atmospheric and ecological regions for the purpose of evaluating air quality model and NOy instrument behavior?

I have no preliminary comments on this charge question.

10. What are the panel's views on utilizing the existing CASTNET and rural NCore networks as a starting infrastructure for the purpose of supporting the NOx/SOx standard?

Both CASTNET and the rural NCore sites provide an excellent opportunity to leverage existing infrastructure and should be exploited when practicable.

11. What are the panel's views on using CASTNET filter pack (FP) to measure total nitrate (particulate nitrate plus nitric acid) as the measurement approach for the purpose of providing annual average values to support the NOx/SOx standard in diagnosing NOy instrument behavior and assist in delineating the relative fractions of contributing oxidized nitrogen species to total ambient oxidized nitrogen.

See comments for sulfate above, #1.

12. What are the panel's view of the broader consideration of using CASTNET, complemented by rural NCore, to serve as a framework for the nationâ€™s rural monitoring of important gases and aerosols in support of secondary standards and evaluating the behavior of regional air quality models?

Based on the provided background information, the existing CASTNET and rural NCore network infrastructure provide a solid framework in support of the secondary standards and also to support the modeling effort. The existing sites are generally well-aligned with the identified eco-systems with perhaps the exception of the northwest United States. It would be very helpful to get input from the modelers about desirable monitoring locations outside of the identified eco-sensitive regions. For example, there are large gaps in areas such as the Central Plains; would this be an important area for monitoring to support model evaluation?

1 "NAPD" New Network: AMoN The Passive Ammonia Monitoring Network", M. Rury, EPA/CAMD.