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# MANE-VU

## Mid-Atlantic/Northeast Visibility Union

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Midwest Ozone Group  
% Mr. Edward L. Kropp  
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Dear Mr. Kropp:

On behalf of MANE-VU and NESCAUM, I would like to thank you for your interest in the January 31, 2001 report entitled, "Regional Haze and Visibility Impairment in the Northeast and the Mid-Atlantic States." As project manager for this report, I would like to take this opportunity to respond to some of your comments on this document.

### A. Process Issues

Regarding the process issues you raised in your comments, this report was published at the end of our first-year grant to support state efforts in planning for compliance with requirements of the regional haze rule and this document was published to satisfy one of our grant requirements. Another task that was agreed to in our first-year grant was to explore organizational structures for a potential regional planning organization hosted by the Ozone Transport Commission. This deliverable was also submitted at the end of our first-year grant period (January 31, 2001). While it would have been ideal to have a fully developed mechanism for stakeholder input and an organizational structure in place prior to the release of this first assessment document, such a mechanism was not in place at that time. The stakeholder meeting on September 19, 2001 was designed to serve this role. As we move forward, stakeholder outreach mechanisms will be in place to allow for timely input on RPO work products.

### B. Technical Comments

#### 1. Micro-Emission Inventories

Micro-emission inventories will play a role in determining reasonably attributable visibility impairment due to nearby emission sources that would be contained in such an inventory. However, as the report points out, regional haze is often present throughout the region and due to the combined emissions of numerous emission sources across broad geographic regions. We feel that the macro-scale emissions inventory information contained in Chapter VI of the report is adequate for an initial assessment of the nature and extent of visibility impairment attributable to regional haze as presented.

## 2. Source-Receptor Relationships

We agree with MOG that trajectory models must be very carefully applied in order to appropriately associate geographic source regions with observed visibility impacts. As included in the January 31, 2001 report, trajectories are used only for illustrative purposes. These are provided to give the reader a sense of the meteorological conditions that existed during the several days prior to severe pollution episodes along the East Coast. In order for a detailed trajectory analysis to “link source regions to the visibility impairing material found in Class I areas of the NE OTC region” a single trajectory is not adequate due to the uncertainty in trajectory models. A subsequent report prepared by NESCAUM for the MANE-VU RPO (*A Basis for Control of BART Eligible Sources*) and a forthcoming technical memorandum on trajectory modeling address these uncertainties and provide methodologies for using ensemble techniques to elucidate these linkages. We welcome your thoughts on the discussion in these documents.

## 3. Discussion of SO<sub>2</sub> and sulfate and the relationship between the two species

Regarding the relationship between SO<sub>2</sub> emissions and visibility trends shown in Figure V-1 (pg. V-11), it is clearly stated that these trends are presented only as a qualitative indicator of baseline conditions and that too few data are available to draw definitive conclusions about recent visibility trends in the Northeast and Mid-Atlantic. We also acknowledge that the trends do not suggest a discernible improvement in visibility over the second half of the 1990s, consistent with MOG comments. While not included in the January report, NESCAUM has discussed elsewhere (NESCAUM, 2001b) the implications of using the deciview metric for tracking progress in the regional haze rule. One of the implications of this choice is that visibility improvement resulting from emissions reductions today will be less noticeable as measured in deciview than a corresponding emissions reduction in the future when measured relative to improved background conditions. Thus although substantial emissions reductions occurred during the 1990s as a result of Phase I of the acid rain program, the corresponding visibility improvement is expected to be difficult to discern in the early stages of our visibility improvement effort.

We agree that the complex interplay between sulfur dioxide, nitrogen oxides and ammonia deserves further research and will certainly have implications for how control strategies are devised and tested. While the January report indicates that these interactions need to be considered in establishing reasonable progress goals, we agree that a stronger emphasis on continued research and a recommendation for future research in these areas is warranted.

NESCAUM stands by its characterization of the monitoring data and description of report figures. While the precise degree to which sulfate affects visibility has not been “prejudged”, it is clear, based on available monitoring and modeling data that sulfate plays a dominant role in the visibility degradation that has been experienced in eastern Class I areas over the past decade. Further study is needed to understand the relationships between sulfate aerosol and its precursor pollutants, chemical interactions and potential control strategies. However, a great deal has already been learned about this pollutant and its effects. Many of the conclusions reached in the NESCAUM report are based on research published by the IMPROVE program (Malm, 2000), the Federal Land Managers’ Air Quality Related Values Workgroup (FLAG, 2000) and numerous researchers who contributed to the Air and Waste Management proceedings *Visual Air Quality: Aerosols and Global Radiation Balance* (AWMA, 1997). It would be a disservice to the abundant research that exists to assume that we know nothing about visibility problems in the eastern United States and must start from scratch.

## 4. Modeling and monitoring recommendations

In Chapter VII of the January report, NESCAUM does address the shortcomings of REMSAD with respect to specific chemical mechanisms and ability to accurately simulate specific episodes with high PM and low visibility. We also point out, however, that REMSAD may be useful for examining aggregate visibility characteristics over long periods of time. Since the January report was published, a new version of REMSAD has been produced and

its release is expected shortly. This new version of REMSAD is purported to have greatly improved nitrate chemistry capable of simulating the nitrate fraction of PM more reliably. NESCAUM continues to feel that REMSAD will play a useful role as one of many analytical tools used to explore visibility issues in the Northeast and Mid-Atlantic.

NESCAUM does cite with favor the reconstructed extinction values that are generated by the IMPROVE program and stand by our statement in the executive summary that the IMPROVE program will “continue to provide crucial inputs to visibility planning efforts.” However, we agree with MOG that there are differences between IMPROVE and other monitoring efforts and that these differences should be understood.

#### 5. Visibility photographs

MOG is correct in pointing out that there are a variety of factors which will affect perceived visibility such as sun angle, location, object/sky contrast, etc. NESCAUM did take care to use photographs taken during the same season and from the same vantage point. The limitations of such photographic comparisons, however, were not explicitly mentioned in the accompanying figure caption. These issues were discussed in at least two other sections of the report (pg. III-16 and pg. IX-10).

#### 6. The Haze Event Case Study

As MOG points out, NESCAUM was careful to qualify the haze event of mid-July 1999 as “unusual in its severity.” The underlying mechanism of pollutant transport which led to the buildup of high levels of fine particulate during that time period was not unusual and is the basis for many of our nation’s current air quality regulatory programs. As stated earlier, NESCAUM does not feel that we should diminish the body of knowledge that has been developed regarding air quality problems simply because we are at the start of a new planning process. Rather, the purpose of this document was to present the research and knowledge that forms the foundation of our current understanding of visibility impairment in the region. This research should be refined, not repeated, during the subsequent planning period.

#### C. Conclusion

While we agree with MOG that policy conclusions should be avoided until the appropriate regional haze investigations have been accomplished over the course of the five-year RPO process, NESCAUM recognizes that adequate discussion of policy *options* will require some assumptions in absence of perfect information. While the regional planning process provides us an opportunity to explore the areas of greatest scientific uncertainty and those with the greatest policy implications, NESCAUM feels that the RPOs are best served by moving forward from our current understanding of air quality problems and applying that knowledge to outstanding issues.

Sincerely,



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Cc: Bruce Carhart, OTC  
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Susan Wierman, MARAMA  
Arthur Marin, NESCAUM

References:

- AWMA, *Visual Air Quality: Aerosols and Global Radiation Balance*, Proceedings of a Specialty Conference Sponsored by AWMA and AGU on September 9-12, 1997 in Bartlett, NH, Air and Waste Management Association, Pittsburgh, PA, 1997.
- FLAG (Federal Land Managers' Air Quality Related Values Workgroup), *Phase I Report*, U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service: December, 2000.
- Malm, W.C. et al., *Spatial and Seasonal Patterns and Temporal Variability of Haze and Its Constituents in the United States: Report III*, Cooperative Institute for Research in the Atmosphere. Colorado State University, Ft. Collins, CO, 2000.