Comments on Particulate Matter Urban-Focused Visibility Assessment –
Second External Review Draft: January 2010
(Dirk Felton February 28, 2010)

1-4. The FRM measurement is not a "dry" measurement. The sampling filters are equilibrated at a specific RH and temperature. A significant amount of water and other volatile components are retained in the FRM measurements. The new continuous FEMs capture more of the volatile components of PM-2.5 than the filter based FRM. Analysis of data from the new FEMs in comparison to FRMs may provide additional insight into the regional effect of humidity on PM-2.5 concentrations and light extinction.

1-6 Since absorption from ambient NO2 can add 5% to the light extinction value, the recent promulgation of the primary NO2 NAAQS should be considered in the assessment. It is likely that controls that reduce NO2 in urban areas will have a significant effect on urban light extinction.

1-8 WinHaze provides an estimate of variable light extinction conditions superimposed on a specific photograph. Is this realistic? Can a person whose vision varies by distance relate to simulations of light extinction in a photograph or on a computer screen at a fixed distance in front of them?

1-12 A secondary urban PM standard would by default apply anywhere that was not a class 1 visibility area. Are there plans to establish monitors in areas other than in large urban areas?

1-14 Indicator: Measuring actual ambient PM including the volatile components is a desirable goal, however, this is likely more important for the primary health based standard than for a secondary "perceived" standard. The IMPROVE program which is responsible for much of the visibility assessments in rural, wilderness and class I visibility areas collects PM using techniques that do not attempt to capture the volatile components of the ambient PM. It is odd that the more difficult to measure PM in actual RH conditions is a necessity for this proposed standard when it is not in use in much of the class 1 visibility monitoring program.

1-15 Averaging Time: The 1-Hr suggestion from EPA staff does not correlate well with the time-frame that local meteorology and varying PM components interact to impact visibility in urban areas. A longer, 4-Hr or morning and afternoon averaging period is still short enough to reasonably capture the changes in urban visibility while long enough to permit realistic forecasting and the possibility for workable control strategies.

2-15 The Washington DC focus group study provides evidence that less emphasis is placed on visibility in the relatively flat northeast corridor. The available viewing distances are much shorter so the acceptable light extinction values are higher. In other words, in the northeast, a higher CPL may be acceptable because the public would not notice the benefits of a more stringent standard.

3-3 The paper describes the existing PM network as limited because it does not capture the spatial and "actual levels" of PM and its components. That statement is a bit disingenuous

considering the authors only utilized data from one or two monitors in each of the urban areas in the assessment. A better approach would be to use all of the available PM and PM component data from each of the urban study areas. The data could be averaged and summarized and the values for standard deviation, minimum and maximum could be utilized in the visibility calculations to help provide a sensitivity analysis for the light extinction calculations.

3-5 The urban visibility assessment claims that less than 24-Hr species data is generally not available which is certainly the case. For the cities that do have hourly PM component data, the authors should validate their modeling approach by comparing their constructed hourly PM component dataset to actual hourly PM component data. Ideally, this model validation would be included in the assessment for at least one city in each geographic region.

3-11 The authors describe why they chose the sites used in the assessment. "For time reasons" is not an acceptable reason to choose a site whose data will be used to inform the promulgation of a NAAQS secondary standard. The site used for the NYC analysis is listed as neighborhood scale but it is essentially a micro-scale site for pollutants that are emitted from motor vehicles. The NYC PM-10 site is a special purpose site installed 4-5 stories above ground to monitor PM in proximity to de-construction and construction activity at the World Trade Center site. The Detroit PM-10 site is adjacent to an automobile manufacturer. The assessment would be better served by using all of the PM data such as is discussed in the response to section 3-3 above.

3-19,20 The authors describe the differences between IMPROVE and CSN data as they relate to the data entered into the light extinction algorithm but fail to provide quantitative estimates of the differences. Some cities such as NYC and Washington DC have both CSN and urban IMPROVE monitors that could be used to determine the significance of the differences between the data sets as related to the extinction calculations.

3-25 The Teflon filter on the FRM does retain some nitrate in warm weather. The EPA sponsored a multi-city evaluation of FRM nitrate retention as compared to the CSN sampler by calendar month. These results should be incorporated into this analysis.

3-26 The CSN program has switched to TOR. The program has also provided analysis for both TOT and TOR during the changeover so that the significance of the change in analysis method can be evaluated.

3-26, 27 PMc should not be determined by subtracting low volume PM-2.5 from high volume PM-10. Regional ratios should be avoided if at all possible.

3-64 The authors attribute high winter carbon PM-2.5 concentrations at the NYC PM-2.5 site to the proximity of the site to the NJ turnpike and port activities. In reality, the high wintertime carbon concentrations are due to the high demand for space and water heating in the NYC metro area.

4-1 The authors suggest the use of an Aethalometer and a collocated nephalometer for the determination of light extinction. The use of the Aethalometer is complicated by the mix of reflective as well as absorptive particles on the Aethalometer filter tape. NATTs sites include

Aethalometers and the data is usually submitted to AQS in hourly format. This data should be reviewed to determine if absorption is significant in relation to scattering and if the Aethalometer is adequate enough to warrant inclusion in the measurement method. The authors should also use the available hourly Aethalometer, MAAP or Sunset EC data from a city in each geographic region to compare to the modeled hourly carbon data used in this analysis?

A-13 The authors used the parameter code 88502 which indicates "Acceptable PM-2.5 AQI and Speciation Mass" for their continuous PM-2.5 dataset. This is not acceptable without a thorough understanding of how that data was submitted. State and local monitoring agencies have latitude in how they adjust data to more closely match filter based FRM data. Some states such as New York use non-linear adjustments based on the Julian day to adjust the data, some use data conversions based on temperature and there are other methods in use. These techniques must be understood by users of the data and included in the references so that the differences between the continuous data used in this assessment and the filter based FRM data can be fully understood.

A-13 The authors collected the continuous PM data used in this assessment from the AirNow system and not from AQS. This is inappropriate and the authors seem to be aware that this is problematic when they note that some of the data that they used in the assessment was not submitted to AQS. The data used in the development of a NAAQS must be of the highest quality. The EPA understands this and has recently expanded the number of parameters that state and local monitoring agencies must certify in the AQS data base. Certified data in AQS is subject to a much higher level of validation than data which is automatically submitted to AirNow. The authors also suggest that it is up to state and local monitoring agencies to update the data in the AirNow system. This is simply not the case and would in fact be a redundant reporting requirement. The EPA was planning to retroactively update the AirNow database with valid data from the AQS system. The authors should determine if this has been done with the data used in the assessment.

C-1 The development of the background concentrations for the principle PM-2.5 components only relies on modeling results. These results need to be verified by other means such as by comparison to monitoring data from "clean" days in each of the areas in the assessment.