Section 12. Summary of Issues and Action Items

This document serves as a bridge between initial concepts for integrating continuous PM monitors presented at the meeting with the Clean Air Science Advisory Committee's Subcommittee on Particle Monitoring in January, 2001 and comprehensive guidance for monitoring agencies. There remain numerous details not addressed at this time that should be addressed to ensure a satisfactory outcome. These issues and other areas of concern include:

- ***Complex program***. The concepts and elements incorporated in this plan are singularly and collectively complex therefore creating a communications challenge. Other approaches were considered, but the potential drawbacks of a simplistic approach were not acceptable. That is, it would have been easy to develop a rigorous non-flexible program easily communicable but conveying little motivation for deployment. Similarly, a program without constraints would likely compromise data quality and interpretability. Thus, a decision was made to accommodate both flexibility and data comparability at the expense of developing and communicating a complex program.

- ***Annual standard versus daily***. The DQO analyses performed to date have assumed that the annual standard is the driving standard. Since the annual standard involves the average of three numbers, each of which is based on at least 44 numbers but usually more than 60, it is clear why decision errors are not very sensitive to measurement imprecision and why it is proposed that the measurement precision performance criterion be 20% CV. DQOs based on the daily standard, which involves the average of 3, annual 98th percentiles, may show that decision errors are sensitive to measurement imprecision. Additional analyses will be performed to assess the importance of measurement imprecision for decision errors associated with the daily standard. Similarly, analyses will be performed to assess the importance of measurement imprecision for decisions made with non-aggregated data, such as AQI reporting.

- ***Rescinding REM certification based on future poor performance***. The REM program is based on demonstrating an acceptable level of comparison between FRM and continuous samplers. This relationship may change as a result of atmospheric changes due to deployment of emission mitigation strategies. Guidance, albeit complex, will allow for a non static relationship. Nonetheless, this potential for aerosol change will require iterative evaluation of instrument performance that is likely, in some instances, to show that a previously approved REM fails performance goals.

- ***Guidance for developing and approving regional equivalent domains***. The information in this document can be applied in a somewhat straightforward manner for approving an instrument for CAC or REM purposes at an individual site. The larger goal is to broaden this acceptance to a "region" where the meteorological and aerosol composition characteristics exhibit consistent behavior and hence throughout which the continuous and FRM methods exhibit similar relationships. Regionality is further complicated by administrative and demographic issues (e.g., multiple monitoring agencies and State boundaries intersecting within a given "region"). This topic has not been adequately addressed in this document and requires

additional effort. The overall complexity of regionality and the use of transformation models might suggest development of a review board to handle REM requests on a case by case basis.

- ***Reliance on FRM measurements as an indicator***. The underlying approaches require comparability of continuous and FRM measurements. The reason for this is that so many objectives relate to the FRM measurement (e.g., NAAQS comparisons, AQI, air quality model application). In many instances, there is no technical reason to expect comparability between disparate measurement approaches. Such comparability is desired given the utility of relating continuous measurements to a wealth of existing FRM data and to incorporate a reference marker. The downside of this approach is that the value of an FRM measurement is assumed or inferred to be greater than that of a candidate method, when in some cases the candidate method may better reflect "true" characteristics of an aerosol.

- ***Specific Guidance on Performance Specifications***. Sections 5 - 8 introduce performance specifications for bias and precision, but several specific details are not addressed. For example, how is bias measured? What is the statistic as well as what is the source of the data to be used in the statistic? Are bias estimates based only on existing collocated instruments or is an independent audit required? How are bias and precision treated on a regional basis, does the failure of one site constitute failure for a region, or are all estimates averaged across a region? What is the appropriate frequency for checking bias and precision? These unique considerations warrant development of a dedicated Quality Assurance program for CAC and REM applications.

- ***Data interpretation and management***. Transformed data are to be submitted to AIRS. How do analysts gain access to raw non-transformed data? Transformation models are based on 24-hr comparisons, yet transformed data will be reported continuously, which may create odd results in discrete hourly reporting. Coding specifications for CAC and REM need to be developed.

- ***Demonstration of performance***. The bias and precision estimates are based on existing network performance. This implies that the testing to meet such specifications should be conducted under conditions consistent with routine operations. This approach should not be interpreted as excluding desired vendor participation. Responsibilities for conducting testing, developing transformations and communicating performance results requires further effort.

- ***Consistency with FEM***. The current Class III equivalency requirements appear to be more strict than what a FRM can meet. That is, the imprecision in the FRM is such that the R^2 requirement can not be met, not because of the challenging instrument, but because of the instrument being used as the standard. This inconsistency needs to be addressed. In doing so, it may make it possible for an instrument to acquire a Class III equivalency.