Mr. Bart Croes Preliminary Review Comments for AAMMS Coarse Particle Consultation

PM10-2.5 Speciation Measurement

1. *Table 1 provides a list of proposed PM10-2.5 species and analysis methods. Are there additional PM10-2.5 target species or methods that can be used to help identify the source of unidentified mass in order to obtain better mass closure?*

Not that I am aware.

2. *Various sampling devices, including dichotomous samplers, MetOne SASS speciation monitors, PM10 and PM2.5 FRMs are potential sampling devices (with the appropriate filter types) for PM10-2.5 speciation. Among these sampler types, which should be included or excluded from the pilot network design? Are there other sampling devices not listed here that should be considered?*

I understand the concerns expressed by Delbert and Peter, but PM-coarse speciation by difference should be considered. One approach is to continue use of the MetOne SASS sampler with a 2.5 µm cut point for ions and metals, add a 10 µm cut point for ions and metals, and calculate PM-coarse species by difference. Even though the flow is lower (6.7 Lpm) we have found in the California network that we always have sufficient material for accurate analyses (few species < LOD), although that may not be the case for other parts of the country. This approach is economical because the standard SASS has three flow controlled channels and two orifice channels. To implement this proposal would be to upgrade one orifice channel to active flow control.

Total, organic and elemental carbon is sampled by the URG 3000N for PM2.5. To implement the carbon speciation by difference would require a second URG with a 10 µm cut point.

A dichotomous sampler would be a superior choice for sampling of fly ash and bioaerosols utilizing SEM and/or protein assay as these species are not expected to be dominant in the PM2.5 size fraction.

3. *What are the PM10-2.5 speciation sampling artifacts that may be encountered using the samplers mentioned above and how should they be addressed? Is speciation by the difference method problematic for PM10-2.5 speciation and if so what specific issues make it problematic?*

Any potential artifacts would be consistent with the PM2.5 speciation program per the difference approach described above.

4. *The current and most widely used PM2.5 speciation sampler is the MetOne SASS and it has a flow rate of 6.7 Liters per minute (Lpm) which is significantly lower than either the FRM for PM10-2.5 mass or the dichotomous sampler (16.7 Lpm). If this sampler was configured for PM10-2.5 by difference, would the 6.7 Lpm flow rate be problematic, especially with the need to compare reconstructed mass to the mass collected by the PM10-2.5 FRM?*

In California, it has not been problematic with the PM2.5 speciation program except with elemental carbon, which has been switched to the URG 3000N sampler. We've found measured SASS mass compares well with measured FRM mass.

5. *Is the amount of particle mass collected on the dichotomous filters (especially the minor flow) sufficient for speciation chemical analysis?*

I defer to others.

PM10-2.5 Species or Components

1. *Table 1 provides a list of proposed PM10-2.5 species and analysis methods. Among these species, which are most important? Are there important PM10-2.5 species or components missing from this list? Are there important analysis methods missing from this list?*

Even though it's not explicitly mentioned, I assume sulfur will be included in the elemental analyses (at minimum it provides a cross check of sulfate ion by IC).

2. *In the consideration of potential ion measurements for PM10-2.5 species, what ions should be on the target list? Are nitrate or ammonium ions important? If so, is an acid gas denuder and nylon filter required for the proper collection of these species in PM10-2.5?*

Nitrate and ammonium are always important. At least in Los Angeles, coarse particle nitrate appears to be significant, but it is usually in the form of sodium nitrate.

3. *The 2004 CD included a list of important PM10-2.5 components which included biological materials and fly ashes. If these species are important to characterize, what specific types of biological materials and fly ashes should be included? Is scanning electron microscopy (SEM) on Teflon filters sufficient to quantify and identify these species? Is the proposed total protein assay technique important to obtain a quantitative indicator of the total biological material present?*

I defer to others.

4. *Can the complication of particle size and absorption effects in XRF be resolved using absorption correction factors? If not, what other method(s) should be considered?*

I defer to others, but we understand these correction factors to be theoretical and crude and that there is no consensus on their use. In California, we do not use any correction factors for PM2.5 elemental analyses. We understand that at most these correction factors would be no greater than 10%, and possibly inconsequential.

5. *Are metal oxides a significant source of interference in thermal-optical analysis (TOA) of PM10-2.5 for OC and EC given the large expected soil component? If so, how should this interference be addressed?*

I defer to others.

Network Design

1. *Are sites with high PM10 and low PM2.5 good candidate sites for PM10-2.5 speciation? Given that there will be some urban and rural NCore monitoring sites with PM10-2.5 speciation, what other factors should be considered in selecting the pilot monitoring and long-term sites or locations?*

Sites with high PM10 and low PM2.5 suggest areas dominated by wind blown dust. If the source is obvious for a particular site, I question the value (and diversion of resources) for investigating an air quality issue that my already be well understood.

2. *If there is an opportunity to modify the NCore PM10-2.5 speciation monitoring requirements during a future rulemaking, should changes to the network design be considered? For example, changing the total number of required monitors and/or the required locations?*

No comment.