To: Fred Butterfield, Designated Federal Officer
EPA SAB, Clean Air Scientific Advisory Committee (CASAC)
Ambient Air Monitoring and Methods Subcommittee (AAMM)

From: George Allen, AAMM subcommittee member, April 1, 2008

The following are written comments based on the Charge Questions in the EPA OAQPS memo to the SAB dated March 3, 2008. These comments also reflect discussion during the March 25 teleconference advisory meeting on a consultation for air monitoring issues related to the lead National Ambient Air Quality Standards. A copy of these comments is also being sent to Dr. Ted Russell, CASAC AAMM Subcommittee Chair.

Questions associated with Attachment 1: Options for Lead NAAQS Indicator: Monitoring Implications.

1. ...please describe the advantages and disadvantages of sampling and analysis of Pb-TSP versus sampling and analysis of Pb-PM10.
2. Is it appropriate to monitor for Pb-PM10 near Pb sources? And if so, under what conditions?
3. One indicator option suggests using scaling Pb-PM10 monitoring data up to an equivalent Pb-TSP level in lieu of Pb-TSP monitoring data. Under what circumstances would it be appropriate to scale data (e.g., non-source oriented sites, low concentration sites) and when would it not be appropriate to scale data?
4. We have limited data collocated Pb-PM10 and Pb-TSP monitoring data. What types and "scaling factors" are appropriate to create using this data (e.g., non-source oriented, source oriented)? What levels are appropriate for the types of scaling factors identified in the white paper?

Comments:

Assuming the Pb NAAQS is substantially tightened to the high end of the CASAC range (0.2 $\mu g/m^3$), I see no significant disadvantage in changing to PM10 as the routine indicator, and a wide range of advantages in not running Hi-Vol samplers. If we are changing the standard and network design to reflect current knowledge of lead sources and exposures, changing to a method that gives air agencies more flexibility can only be a good thing. If there are elevated levels of lead (relative to the new NAAQS), they are likely to be source oriented. A PM10 lead sample may (worst case) measure only half of what a Hi-Vol TSP sampler might, but one will still know there is a problem with fugitive lead emissions and a need for a control strategy. I am not in favor of any “scaling” approach when it comes to compliance lead monitoring. The connection between levels of lead measured in the air and actual dose of lead to sensitive populations is loose at best and random at worst, given the dominant exposure pathways. If there is concern about PM10 measuring somewhat less lead than TSP, have the standard reflect that by adding an additional margin of safety. If the lead NAAQS drops an order of magnitude, that is not much of an issue. However, if the revised lead NAAQS does not change, or is tightened only a modest amount or weakened by the form, then a scaling factor may be needed.

Questions associated with Attachment 2: Draft Federal Reference Method (FRM) and Federal Equivalent Method (FEM) Criteria for Lead in PM10 (Pb-PM10):

1. Is it appropriate to use the low-volume PM10-c FRM sampler as the Pb-PM10 FRM sampler?
2. What other PM10 samplers should be considered as either FRM or FEM for the Pb-PM10 FRM?
3. Is XRF an appropriate Pb-PM10 FRM analysis method?
4. What other analysis methods should be considered for FRM or FEM for the Pb-PM10 FRM?
5. Have we selected appropriate precision, bias, and method detection limit requirements for FEM evaluation?

Comments:

This attachment is very well written with only minor omissions. It is appropriate to use the low-volume PM10-c FRM sampler as the Pb-PM10 FRM sampler. Sequential PM10 samplers should also be allowed, either as FRM or FEM samplers. The dichotomous sampler is an obvious candidate for an FEM sampler for lead. While XRF may be appropriate for an FEM analytical method, ICPMS or GFAA should be used for the FRM analytical method since those methods do not have the potential for arsenic interference that XRF has. When properly done, using all three lead emission peaks to assess and correct for arsenic interference, XRF is suitable for routine lead analysis under an FEM designation. It should be noted that other elements may suffer from self-absorption errors with heavily loaded filters, so some caution may be needed if all reported XRF elements are used for other purposes. The bias and method detection limits in this draft are appropriate. I would suggest that the FEM precision be tightened from 15% to 10%.

Questions associated with Attachment 3: Lead NAAQS Ambient Air Monitoring Network: Network Design Options Under Consideration.

1. What types of monitoring sites should be emphasized in the network design (e.g., source oriented monitors, population monitors, near roadway monitors)?
2. We are considering proposing requirements for monitoring near sources exceeding an emissions threshold and discuss a number of options for determining this threshold in the white paper. What options should be considered in establishing an emissions threshold?
3. We are considering proposing requirements for non-source oriented monitoring in large urban areas to provide additional information on ambient air concentrations in urban areas. Considering other monitoring priorities and a potential requirement for Pb monitoring near sources, what size of a non-source oriented Pb network is appropriate?
4. What factors should we base non-source oriented monitoring requirements on (e.g., population, design value)?
5. We are considering proposing requirements for Pb monitoring near roadways and interstates. Is it appropriate to include separate monitoring requirements for near roadway monitoring, or should near roadway monitors be a part of the non-source oriented monitoring requirement?
6. Under what conditions would it be appropriate to waive the monitoring requirements for either source or non-source oriented monitors?

Comments:
First, not knowing what the final lead NAAQS will be (including the form, not just the concentration), it is very difficult to comment on network design. But assuming the final NAAQS will not be lower than 0.2 $\mu g/m^3$, with a form that does not substantially weaken the effective standard, I would suggest the network focus on source and population oriented sites. For source oriented sites, assuming the emissions are reasonably well known one could model the near-field impact to determine if monitoring is necessary. Alternatively, if there is large uncertainty in emissions, limited preliminary monitoring could be deployed to determine if the ambient impact of the source requires additional or continued monitoring. Non-source ambient monitoring, e.g., neighborhood to urban scale siting, should consider both the design value and to a lesser extent, the population. We don't want to have a large (big-city) urban network of lead monitoring if all the sites are well below the NAAQS. For near-roadway monitoring, this also depends on the level and form of the NAAQS, but I would recommend only a limited monitoring (e.g., pilot) effort for this source at least initially until more is known about both the extent of elevated lead air concentrations near roadways as well as the value and form of the final lead NAAQS. As for waiving or modifying monitoring requirements, if it can be shown by historical data or other reasonable approaches that lead air levels are well below the NAAQS, then less monitoring should be done.

Questions associated with Attachment 4: Lead NAAQS Ambient Air Monitoring Network: Sampling Frequency Options Under Consideration.
1. What sampling frequency would be appropriate if the Pb NAAQS is based on a monthly average?
2. Is it appropriate to relax the sampling frequency in areas of low Pb concentration? If so, at what percent of the Pb NAAQS?
3. Is it appropriate to relax the sampling frequency in areas considerably higher than the NAAQS? If so, at what percent of the Pb NAAQS?

Comments:
First I want to clearly state that sampling frequency issues (and the level of public health protection) are highly dependent on not only the level of the NAAQS, but also the form of the NAAQS; it is essential that any discussion on this topic include the form whenever a value is mentioned. Sampling frequency for a simple monthly average NAAQS should be at least every other day if not daily for sites that are near or above the NAAQS. If the form is "3-year average of second highest month" (an option discussed in the staff paper), then every third day sampling may be sufficient for sites near or above the NAAQS. It is appropriate to reduce sample frequency at sites well below (50%?) the NAAQS, but again the sample frequency depends on the form of the NAAQS. I would suggest third-day for a simple monthly mean, and sixth-day for a "3-year mean of second highest month" form. I would also like to note that if a form similar to "3-year average of second highest month" is adopted for the lead NAAQS, this would be inconsistent with the health concerns leading us towards a 1-month metric. Additionally, for a given NAAQS value such as 0.2 $\mu g/m^3$, a form as noted above results in a substantially weaker lead NAAQS than a simple 1-month form.