

Monitoring –EPA IG’s Questions—Draft Responses

Control Strategies

8) Are there enough skilled experts available to help the states (EI, modeling, data analysts)? Is more training needed in any of these areas? How will this hinder the development of control strategies?

RPO expertise and resources are available to state and local agencies, presumably for PM2.5 SIP development in addition to regional haze activities. It is not clear, however, whether all state and locals have sufficient access to skilled experts. One opinion was voiced that states need EI experts on their staffs; another opinion was that it wasn’t possible to tell at the local level what knowledge gaps existed where. It was noted that EPA provided in the past useful data analysis tools, namely two freeware versions of receptor models, ‘unmix’ and ‘pmf’ and that ORD support would be extremely useful in the future and should be encouraged

9) According to a National Academy of Science report, national programs (Acid Rain and unleaded gasoline) contributed to 90% of air quality reductions - do you consider the SIP process to be out dated and needing to be revised? If so, what reasons could account for the ineffectiveness of the SIP process in comparison to National Programs when it comes to reducing overall levels?

The group disagreed with the 90% figure in the statement, attributed to NAS that national programs (Acid Rain and unleaded gasoline) contributed to 90% of air quality reductions.

Source Apportionment

10) Who should do source apportionment, EPA or the states? Why?

Source apportionment analyses require certain expertise, which is possessed by EPA, some states, and contractors. To be successful, however, any such analyses should involve state/local agency personnel because of the locality’s greater familiarity with sources.

11) How does a state determine whether sources outside of their state are contributing to their PM2.5 problem?

(We decided that this was a modeling, not monitoring, question. In terms of modeling methods to determine source contributions, a state can use an air quality model, such as CMAQ or CAMx, or data analysis techniques, such as ‘pmf’ and back trajectories.)

Data

13) How many years of Speciation data are available? Is this enough? If not, how does this effect modeling results, emission inventory verification, development of control strategies, and other?

Approximately 3-4 years of speciation data are available from the urban speciation trends network (STN), and as much as 15 years from the rural IMPROVE network. It was felt that this is not enough; more is needed. Comments were made that it was inconsistent as a policy matter to reduce speciation monitoring and have multipollutant strategies. On the other hand, concerns were voiced about the quality of data that is presently available. If the data are not particularly good, then the network should not be expanded. It is, moreover, inefficient to collect the data through filters.

One respondent summarized by saying that that the quality of the data should be scrutinized; collection should continue beyond just 3-4 years; and in the long run, continuous monitoring is necessary and far more efficient. More continuous speciated data is particularly important in understanding how air quality models work, or do not work. It was noted that data for IMPROVE sites is better and linked to regional haze.

14) We understand there are completed Supersites reports, however, easy access to the reports are lacking. What should EPA do to facilitate the distribution of this important information?

It was noted by respondents that there is presently little access to the Supersites data.. The Supersite Principal Investigators are keeping the data closely held and EPA is having “by invitation only” meetings. There is some publication in professional journals, but on the whole it is a very unsatisfactory situation. Data should be available, possibly on EPA’s website

15) An estimated \$25 million has gone into the Supersites efforts - has this money been well spent? EPA is developing workshops with the Supersites Principal Investigators to synthesize their results. Is this a good idea? How much should EPA pursue this effort?

It was agreed that the Supersites efforts and \$25 million spent has been beneficial, in fact “invaluable, “ although one commenter said that there was not enough funding to complete necessary follow-up work (e.g., analysis and communication of data) and another commented that “it is too soon to say.” One person said that within the new national ambient air monitoring strategy there was an unfunded Supersite-like component (i.e., NCORE Level I sites). EPA needs to determine how these sites will be paid for. Also, there were a number of tiers, and a welcome emphasis on continuous methods.

The consensus was that the Supersites effort was/is a good idea but that the purpose/goals of Supersite monitoring needed definition and the effort should relate to air quality.

16) Does the data analysis of the speciation monitoring data need to be improved? Which would help more improving the monitors first or improving the data analysis methods?

Yes. One person said that you can't really tell until you begin using continuous monitoring for air quality monitoring modeling. It was noted that improvement of the monitors and improvement of the data analysis methods can't really be separated, but "go hand in hand." It was also noted that ORD should have a role in developing speciation monitors that are consistent in their functions and capabilities.

17) Concerning PM2.5, we realize more information is better. That being said, do the states need the speciation network to be able to speciate the components of PM2.5 (i.e., sulfate, nitrates) further? Why? Why not? As far as this is concern speciating the different types of nitrate and sulfate -- is this a function of the monitor or the data analysis methods, (i.e., could this be done with the current monitors)?

One person felt, and there was group agreement, that the states need the speciation network to be able to speciate not only the sulfate and nitrates components of PM2.5 but need to include carbon (including separation into organic and elemental components), as well as ammonia. This speciation should be done on a continuous basis. ~~With regard to speciation of the different types of nitrate and sulfate, such speciation is entirely a function of the monitors, not the data analysis methods.~~ Speciation of the particle phase, eg ammonium, simply cannot be done with monitors that employ nylon filters.

Networks

18) Is there adequate coverage with speciation monitors or are there gaps in coverage?

Several answers were given regarding the question of whether there is adequate coverage with speciation monitors. One person felt that the spatial coverage might be considered adequate but that it would be useful to have a higher time resolve for some of the key species. Another person noted that it was difficult to answer this question because "we haven't really had a chance to look at the analyzed data." He noted that the purpose of the speciation monitoring is not clear. Will the data be used for attainment or nonattainment determinations or other purposes? If other purposes, what are they? A third person felt that one purpose would be to ascertain the location of emissions hotspots.

Additionally, it was noted that the coverage seemed adequate now, but that if and when the PM2.5 standard becomes more stringent, then the adequacy of the speciation network would have to be reevaluated.

A further comment was that there are enough monitors in the various airsheds but that he would benefit from a different sampling schedule that would be more seasonally appropriate.

19) EPA is advocating reducing the number of speciation monitors - do you think this is appropriate? Why? Why not?

The strong and unanimous sentiment of the group was that the number of speciation monitors should not be reduced. [Note: we need to be able to articulate why this would be inappropriate—this may be the core question for the IG]

A fundamental principle of EPA's national monitoring strategy is to conduct network assessments to make informed decisions about any network changes. As noted above, "we haven't really had a chance to look at the analyzed data." This needs to be done before changes to the STN are made. Specifically, we need to define our monitoring objectives and then design a monitoring network to meet those objectives. Network design questions include what pollutants to measure, where (locations) and when (frequency) to measure them, and what measurement methods to use.

20) Granted it is not practical to have speciation monitors in every county of the US, what tools are available to minimize gaps in coverage? And how do they work?

Regarding what tools are available to minimize gaps in coverage where there are no speciation monitors, the group felt that we needed a better sense of the purpose of the monitoring and suggested that spatial statistics (e.g., data mapping methods) would help fill the gap.

21) How are IMPROVE monitors different than STN monitors? How compatible (and not compatible) is IMPROVE data with the STN monitors?

A study of collocated STN (urban) and IMPROVE (rural) monitors has demonstrated that there is an interrelationship between the two types of monitors. The group noted that quality assurance should be developed/provided for checking the data quality from the IMPROVE monitors. There are presently no field audits. It was further noted that the protocols are significantly different between IMPROVE and STN monitors (with, for example, refrigeration required by IMPROVE protocols and not STN and other different operating procedures and practices also different). It was stated as well that EPA and some states are using the data "as is" but you cannot convert carbon data sets between the two. This is problematic because we need to use both data sets to provide a complete picture of PM_{2.5} species concentrations – IMPROVE data to characterize rural concentrations and STN data to characterize urban concentrations.

22) In hindsight, do you think that EPA should have deployed all IMPROVE monitors in lieu of developing the Speciation Trends Network (STN) for the sake of consistency? Why? Why not?

No. The group did not feel that EPA should have deployed all IMPROVE monitors in lieu of developing the Speciation Trends Network (STN) for the sake of consistency. Because the lab capacity for IMPROVE monitors didn't exist, it was necessary that monitoring professionals have time to consider both programs. EPA, however, should have done a comparison analysis of the two types of monitors. A question that is relevant to the debate is "who are the customers for each type of monitor."

23) What is the difference between regular speciation monitors and semi-continuous speciation monitors and continuous speciation monitors? How far along are they all? What can they do or not do? How much should they be developed? And how so? Which of the three are preferable?

Finally, regarding the question about the difference between regular speciation monitors and semi-continuous speciation monitors, it was stated emphatically that “we need continuous monitors; we never have enough temporal data.” And further, “we achieve a higher temporal resolution with a continuous speciation approach.” The data obtained from continuous and regular filter-based speciation monitors are clearly different. Continuous monitors provide data for individual hours, while filter-based monitors provide data for 24-hour periods (midnight-to-midnight). “Continuous speciation monitors that work” are clearly preferable, it was concluded.