

## **Dr. Kazuhiko Ito Preliminary Review Comments on Ozone Network Design Issues**

### **Urban Network Design Requirements**

1. *Considering the ozone minimum monitoring requirements that are already promulgated through 40 CFR Part 58, is the considered change to these requirements sufficient to ensure a minimally adequate network in urban areas?*

EPA may need to accommodate the concerns expressed by State air monitoring agencies and multi-state air planning organizations that these requirements ignore the needs that States and localities have for additional monitors to measure ozone levels in areas with populations under 350,000. Judging from the figure in the white paper, it looks like there may be about 20 MSAs with less than 350,000 people that may be near the border of non-attainment.

2. *We are considering a timeline that would require newly required ozone monitors to be operational no later than January 1, 2011, based on the expectation that final rulemaking will be completed in 2009. Is this schedule appropriate or should EPA consider providing an additional year for new monitors to be deployed (or relocated)? What would be the advantages or disadvantages of a staggered deployment schedule?*

It seems to me that there is no need to delay the deployment for the larger MSAs with existing sites even if setting up additional sites may take additional time, unless EPA needs to relocate some of the existing sites. I don't see disadvantage of a staggered deployment schedule if they are necessary.

### **Non-Urban Network Design Requirements**

1. *We are considering a new requirement that each State operate a minimum of three non-urban ozone monitors to meet certain objectives (described above). Considering the stated objectives of the non-urban ozone monitoring requirements, is three required monitors per state sufficient?*

There must be something like "Data Quality Objectives" (DQO) to determine whether or not some specific number of monitors is sufficient to achieve the goal. Without knowing the goal in some numerical manner, this question cannot be concretely answered. I suppose the following questions are more specific.

2. *What factors should be considered in the siting of ozone monitors to assess impacts on ozone sensitive vegetation in national parks, wilderness areas, and other ecosystems?*

I am not familiar with the quantitative relationships (i.e., linear or non-linear?) between ozone and the effects on sensitive vegetations, but the siting of the monitors should consider: (1) the known quantitative relationship between ozone and the sensitive vegetation; (2) the spatial distribution of such vegetations; and, (3) prediction model of ozone concentrations over the areas where sensitive vegetations exist. The siting should be done to minimize the uncertainty associated with the ozone prediction over the areas that are densely populated with such vegetations.

3. *In addition to the objectives that have been described for non-urban ozone monitors, what other objectives should be considered in the final network design? How would the consideration of additional objectives, if any, effect the minimum number of non-urban required monitors?*

I don't personally use them, but there are models (e.g., CMAQ) out there that predict air pollution levels including ozone. I imagine that prediction and model validation of these models rely on the locations of

existing monitors. If EPA uses these models, why not also consider siting monitors where the model performance would improve.

4. *Current ozone monitoring regulations (described in Appendix E of 40 CFR part 58) include requirements for station and probe siting (e.g., vertical distance of inlets, set-back distances from roadways). Are these requirements (that have been developed for urban monitors) appropriate for non-urban ozone monitors? What changes, if any, should be considered?*

I took a quick look at Appendix E of 40 CFR part 58. Regarding the probe height, it says: "The probe or at least 80 percent of the monitoring path must be located between 3 and 15 meters above ground level." I am not sure if this height requirement is appropriate in determining the exposure of sensitive vegetation. Perhaps it needs to be lower, but one needs to know the concentration gradient (profile) of ozone near the ground to take into consideration scavenging of ozone by the surface characteristics including those of vegetations.

5. *We believe that States should have the option of designating that existing non-urban ozone monitors that are potentially operated by another agency (e.g., CASTNET monitors operated by the National Park Service) be utilized for meeting certain non-urban minimum monitoring requirements. What factors should States use to determine if such monitors are appropriate to include in their networks?*

I am not familiar with the difference in the procedures, analytical methods, or siting requirements between the CASTNET monitors vs. EPA monitors, so I cannot provide specific comments, but if they are comparable, then any CASTNET monitors that meet requirements in Questions 2, 3, and 4 above should be included.

### **Ozone Monitoring Season**

1. *We are considering changes to the required ozone monitoring seasons based on analyses of the patterns of ozone exceedances and occurrences of the Moderate level of the Air Quality Index, during periods outside of the currently required seasons. What other factors should be considered, if any, in the determination of the length of the required monitoring season for each State?*

I am generally opposed to restricting the available data for research purposes. If the change results in shorter sampling periods, such decision needs to take into consideration the balance between the possible information to be lost vs. the information gained by additional sampling locations (because you trade these two for a fixed budget, I assume). It should be noted that, as far as the health effects are concerned, the current NAAQS is NOT based on a clear-cut threshold below which we don't observe any effects. This means that, if we shutdown ozone monitoring for areas and periods we observe levels below the current standard, then we are eliminating the future data for research from which we will base our future standards!

2. *We believe that ozone monitors that are located at NCore stations should be operated on a year-round monitoring schedule. Under what circumstances might it be appropriate to require year-round monitoring at other stations beside NCore?*

If the spatial variation of ozone is not easily predicted in a MSA, additional year-round monitors may be needed to characterize such variations. Also, the seasonal cycles and the relationship between ozone and other pollutants must be different from city to city or region to region.

Also, as far as air pollution epidemiological studies are concerned, I sense that the more emphasis will be placed in multi-pollutant evaluation. Then, the NAAQS will also have to emphasize multi-pollutant

context. If this happens, then, the longer the ozone sampling period, the better for the multi-pollutant evaluation.

3. *We are considering that changes to the required ozone monitoring season be applicable to existing monitors beginning in 2010, one year ahead of the deployment schedule for newly required ozone monitors. Is this schedule reasonable for existing monitors?*

I am not familiar with the operational aspect of changing (extending) the ozone monitoring season, but given that the monitors are continuous analyzers, I don't imagine it would be unfeasible to do this for existing monitors ahead of the deployment schedule.