5.0 AN EXPLANATION OF EPA's NINE-FACTOR ANALYSIS

In April 2003, EPA issued guidance to state and local air pollution control agencies and tribes on the process for designating areas for the PM2.5 NAAQS. In this guidance, EPA applied a presumption that the boundaries for urban nonattainment areas should be based on the metropolitan area boundaries as defined by the U.S. Office of Management and Budget (OMB). This presumption is based on evidence that violations of the PM2.5 air quality standards generally include a significant urban-scale contribution as well as a significant larger-scale regional contribution. The CAA requires that any area with a violating monitor and nearby sources contributing to the violation must be designated nonattainment. EPA presented nine factors that it will consider when assessing whether to exclude portions of a metropolitan area and whether to include additional nearby areas outside the metropolitan area as part of the designated nonattainment area. This chapter contains a discussion of these nine factors.

5.1 Factor 1: Emissions in Areas Potentially Included Versus Excluded from the Nonattainment Area

The analysis for Factor 1 examines emissions of carbonaceous particles (carbon), inorganic particles (crustal), SO_2, and NOx. EPA computed a composite emission score for each county by multiplying the county's emissions as a fraction of the metropolitan area emissions for each of these pollutants times a corresponding air quality weighting factor. These scores for the metropolitan area counties add to 100. The air quality weighting factors for each area are given and reflect the percentages of the total estimated urban excess value found as carbonaceous particles, miscellaneous inorganic particles (crustal material), ammonium sulfate, and ammonium nitrate. Tables presented under Factor 1 provide the carbonaceous particles, inorganic particles, SO_2, and NOx emissions and the composite emission scores for the counties in the corresponding metropolitan area and adjacent counties. Emissions data are derived from the NEI and are for 2001, given in tons per year. Metropolitan area counties are shown in boldface. Emissions data indicate the potential for a county to contribute to observed violations, often making the emissions data the most important factor in assessing boundaries of nonattainment areas.

Urban excess values are derived by comparing urban monitored component concentrations against rural monitored component concentrations. Concentrations of the four PM2.5 components are obtained from local data if available (or, if necessary, from the nearest available urban site), and are compared to available rural concentrations. The monitoring sites used for this purpose are identified in Chapter 3. Although this information is air quality information, it is presented under Factor 1 due to its integration into the analysis of emissions information.

5.2 Factor 2: Air Quality in Potentially Included Versus Excluded Areas

The air quality analysis looks at the annual average design value for each area based on data for the 2001-2003 period. Counties without monitors are not listed.

5.3 Factor 3: Population Density and Degree of Urbanization Including Commercial Development in Included Versus Excluded Areas

Tables presented under Factor 3 show the 2003 population for each metropolitan area, as well as the population density for each county in that area. Population data indicate the likelihood of population-based emissions that might contribute to violations.

5.4 Factor 4: Traffic and Commuting Patterns

The traffic and commuting analysis looks at the number of commuters in each county who drive to another county within the metropolitan area ("Number"), the percent of total commuters in each county who commute to other counties within the metropolitan area ("percent"), as well as the total Vehicle Miles Traveled (VMT) for each county in thousands of miles. A county with numerous commuters is generally an integral part of the area and would be an appropriate part of the domain of some mobile source emission control strategies, thus warranting inclusion in the nonattainment area.

Note that the percent of commuters traveling to counties within the metropolitan area is based on the total number of commuters from that county. This total includes commuters who may travel outside the metropolitan area from their county of origin.

5.5 Factor 5: Expected Growth

The expected growth analysis looks at the percent growth for counties in each metropolitan area from 1990 to 2000.

5.6 Factor 6: Meteorology

The meteorology analysis looks at wind data gathered over a 32-year period by the National Weather Service. Tables presented under Factor 6 list the year-round average prevailing surface wind directions by quadrant for each county in the corresponding metropolitan area. These data show that annual average PM2.5 concentrations are influenced by emissions in any direction at various times, but these data may also suggest that emissions in some directions relative to the violation may be more prone to contribute than emissions in other directions.

5.7 Factor 7: Geography/Topography

The geography/topography analysis looks at physical features of the land that might have an effect on the airshed and, therefore, on the distribution of particulate matter over an area.

5.8 Factor 8: Jurisdictional Boundaries

The analysis of jurisdictional boundaries looks at the planning and organizational structure of an area to determine if the implementation of controls in a potential nonattainment area can be carried out in a cohesive manner.

5.9 Factor 9: Level of Control of Emission Sources

The level of control analysis looks at the emission controls currently implemented in each area.