



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards (OAQPS)
Research Triangle Park, North Carolina 27711

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MEMORANDUM

SUBJECT: Draft Analyses of Particulate Matter (PM) Data for the PM NAAQS Review

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The purpose of this memorandum is to describe and summarize multiple sets of analyses conducted for the review of the Particulate Matter (PM) national ambient air quality standards (NAAQS). PM_{2.5}, PM₁₀, and PM_{10-2.5} data (the latter generally estimated via difference method from collocated PM_{2.5} and PM₁₀ instruments) were analyzed, as well as PM composition information. Most PM_{2.5} and PM₁₀ data, and some corresponding meteorological information, were extracted from EPA's Air Quality System (AQS) database on various dates in July and August of 2004. PM_{2.5} composition data from urban sites in the EPA Speciation Network (ESpN) were retrieved from AQS in July 2004. PM mass and PM_{2.5} composition data, from typically rural sites in the Interagency Monitoring of PROtected Visual Environmental (IMPROVE) aerosol monitoring network, were acquired from the National Park Service in October 2004. Additional PM composition data were obtained from EPA's "Supersites" program (for the Los Angeles metropolitan area, data were obtained from the principal investigator) in June 2004. Additional raw meteorological data were obtained from the National Weather Service; a database of 10-year average relative humidity-related measures was provided by Science Applications International Corporation (SAIC), an EPA contractor. Meteorological data were needed for visibility-related analyses, and also to convert AQS PM₁₀ samples reported at 'standard conditions' (25° C, 760 mm Hg) to 'local conditions' (actual temperature and pressure). The conversion was necessary to calculate accurate estimates for PM_{10-2.5}; PM₁₀ data are generally reported to AQS at standard conditions, and PM_{2.5} data are reported at local conditions.

There are four attachments to this memo, each corresponding to the different types of data analyzed: Attachment A describes the AQS-based, 24-hour duration PM analyses; Attachment B describes the AQS-based hourly PM characterization analyses; Attachment C describes the PM speciation (ESpN, IMPROVE, and Supersite) data analyses; and Attachment D describes the PM visibility-related analyses. Each attachment itemizes specific analysis tasks and notes related goals, assumptions, caveats, and processing methodology. Additional pertinent

details are provided in the included presentation-format outputs, which include text, tables, maps, and graphs.

All AQS-based 24-hour duration PM (10 and 2.5 micron size cuts) data and hourly PM₁₀ data used in the analyses were sampled with Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM). Hourly AQS PM_{2.5} data and particle data collected in the ES_{PN}, IMPROVE, and Supersite networks (Attachment C) generally utilized non-FRM/FEM techniques.

Some analysis results are summarized at a broad regional level using the geographic regions specified below. The area definitions correspond to the regions utilized in previous EPA reports. The origin of the PM region definitions can be traced back to Figure 6-30 of EPA's 1996 PM Criteria Document, which identified regions on the basis of "uniqueness in aerosol trends, seasonality, size distribution, or chemical composition." Some sites (e.g., those in Alaska, Hawaii, Puerto Rico, and the Virgin Islands) were not assigned to a PM region. For these analyses, these sites were placed in a category labeled as 'Not in PM Region'. Data for these sites are excluded from charts shown 'by region' but are included elsewhere. Some analyses compare the eastern U.S. ('East') to the western U.S. ('West'); PM Regions 1, 2, and 3 are considered the 'East' and PM regions 4, 5, 6, and 7 are defined as the 'West'.

PM REGION CODE	PM REGION DESCRIPTION	HOW DEFINED
1	Northeast	ME, NH, VT, MA, RI, CT, NJ, DE, MD*, PA*, NY*, VA*, WV* (*east of -78.50° W longitude)
2	Southeast	NC, SC, TN, GA, FL, AL, MS, LA, AR, OK*, TX* (*east of -97.70° W longitude)
3	Industrial Midwest	NY*, PA*, WV*, VA*, KY, OH, MI, IN, IL, WI#, MN#, IA#, MO# (*west of -78.50° W longitude, #east of -91.50° W longitude)
4	Upper Midwest	MN*, WI*, IA*, MO*, ND, SD, NE, KS, CO# (*west of -91.50° W longitude, #east of -104.05° W longitude)
5	Southwest	OK*, TX*, NM, AZ, NV#, CA# (*west of -97.70° W longitude, #south of 37.00° N latitude and east of -115.50° W longitude)
6	Northwest	WA, ID, MT, WY, UT, OR, CO*, CA#, NV# (*west of -104.05° W longitude, #north of 37.00° N latitude)
7	Southern California	CA*, NV# (*west of -115.50° W longitude and south of 37.00° N latitude)

For additional information on the analyses documented in the attachments, please contact Mark Schmidt at (919) 541-2416.

4 Attachments