

July 17, 1997

FACT SHEET

EPA'S MONITORING REQUIREMENTS FOR PARTICULATE MATTER

Today's Action...

- ◆ Today, EPA is revising the monitoring requirements for particulate matter (PM) to support revisions to the National Ambient Air Quality Standards (NAAQS) for particulate matter.
- ◆ In a separate action, EPA is issuing the final rules establishing new NAAQS for fine particles. An extensive ambient air quality monitoring network for PM_{2.5} (fine particles) does not exist. These monitoring data will be critical in determining which areas meet or do not meet the revised PM-fine standards. This rulemaking provides the basis for establishing a PM_{2.5} monitoring network.
- ◆ EPA is seeking resources to fund the purchase of all the new PM_{2.5} monitors and fund a major portion of the other costs associated with establishing the PM_{2.5} monitoring network.
- ◆ Among other things, the final rule establishes a new federal reference method for measuring fine particles, new criteria for placement of monitors, new schedules for data collection, and new procedures for ensuring the quality of particulate matter data.
- ◆ Procedures for establishing equivalent monitoring methods for PM_{2.5} are also described. This will ensure that new, improved and easy to use monitoring methods can be incorporated into the monitoring program.
- ◆ EPA's rule will retain much of the previous monitoring approach for PM₁₀. The principle modifications involve a change in the sampling frequency and a reduction in the number of data collection locations.
- ◆ EPA is exploring opportunities to coordinate and integrate the existing visibility monitoring requirements with the new ambient air quality monitoring requirements for particulate matter. This will serve to accommodate a better regional haze program, reduce burdens, and achieve multiple monitoring objectives.
- ◆ The effective date of these monitoring regulations will be 60 days after the actual promulgation date.

Background

- ◆ EPA requires different areas to establish and maintain air quality monitoring networks for a variety of air pollutants, including ozone, particulate matter, nitrogen dioxide, lead, carbon monoxide, and sulfur dioxide.
- ◆ Since the 1980s, EPA has required areas to monitor for PM₁₀, particles with a nominal size less than 10 micrometers in diameter. New health studies have indicated that particles smaller than PM₁₀ can pose serious health threats. This rule establishes monitoring protocols for PM_{2.5}. One-hundred fifty areas currently monitor for PM_{2.5}.
- ◆ To ensure national consistency in air pollution monitoring, a federal reference method is used for making comparisons to the standards. For particulate matter, the federal reference method is the ambient sampling device that defines the measurement of particulate matter.
- ◆ On December 13, 1996, EPA proposed new monitoring requirements for PM_{2.5} in conjunction with the proposed NAAQS for fine particles.
- ◆ In developing the proposal, EPA consulted with the Clean Air Scientific Advisory Committee.
- ◆ In addition, EPA staff has discussed monitoring issues at meetings with State and local agencies over the past 2 years.
- ◆ In January 1997, EPA held a public meeting on its proposed PM_{2.5} monitoring regulations. EPA received extensive public comment on the proposals. The Agency carefully reviewed and analyzed these public comments in developing its final rules.

Summary of the Final Rules

PM_{2.5} Monitoring

Reference and Equivalent Samplers

- ◆ EPA has established a new federal reference method for PM_{2.5}. Specifications for the reference method sampler allow various sampler manufacturers to design and fabricate samplers that will meet the specifications.
- ◆ Three classes of equivalent method are established. Class I equivalent methods

provide capability for collection of several sequential samples automatically without intermediate operator service. This will permit easier and more cost efficient sampling on a daily basis. Class II equivalent methods include all other filter based methods that produce a 24-hour measurement. Finally, Class III equivalent methods include both continuous or semi-continuous methods.

Network Design

- ◆ The new PM_{2.5} network will consist of core community-oriented monitors; many will be required to sample every day (or continuously), and supplementary monitors that will be allowed to sample less frequently. The core monitors are required in all of the largest metropolitan areas. The supplementary monitors will provide coverage in small cities and rural areas, some of which are intended to study the long-range transport of fine particles.
- ◆ Frequent measurements will be focused in the most heavily polluted or densely populated areas and are important to understand episodic behavior of PM_{2.5}. These monitors will also establish peak concentrations. This information will allow EPA to establish effective emission control strategies to assure protection of public health.
- ◆ The network of required monitors will be phased in over a 3-4-year period beginning in 1997. In 1998, all metropolitan areas with at least 500,000 people are required to have at least one core monitor and each State is required to have at least two additional monitors. Additional monitoring sites will also be established. Areas will be selected for monitoring by the State; States will select monitoring sites according to the likelihood of observing high PM_{2.5} concentrations and based on the size of the affected population. In addition, one PM_{2.5} site would be collocated at one site in each of the "serious," "severe," or "extreme" ozone nonattainment areas in order to study the relationship between ozone and fine particles. During the subsequent years, all other required core and other required monitors will be added, including those needed to study regional transport.
- ◆ In addition, special purpose monitors will be used to identify potential PM_{2.5} problem areas and help define the boundaries, clarify diurnal patterns, determine the spatial scale of high concentration areas, and help characterize the chemical composition of PM (using alternative samplers and supplemental analyzers), especially on high concentration days or during special studies. Special purpose monitors are an important part of the overall PM monitoring program, and EPA is working to financially support their operation.
- ◆ The new network design and siting requirements mandate the placement of

PM_{2.5} monitors outside population centers in more rural areas for two reasons: 1) to provide the air quality data necessary to facilitate implementation of the NAAQS, and 2) to augment the existing visibility fine particle monitoring network. The coordination of these two monitoring objectives will facilitate implementation of a regional haze program and lead to an integrated monitoring program for fine particles.

- ◆ The network will also assist in reporting of data to the public, especially during air pollution episodes. To these ends, additional monitoring requirements include the use of continuous particulate matter measuring devices (such as nephelometers) at some core monitoring sites.
- ◆ Selected monitors will be set up to track long-term trends of PM and its chemical constituents. This is necessary to understand the emission sources contributing to fine particles, study the effectiveness of emission control programs, and better understand trends in population exposure to fine particles.

Comparison to the Standards with Monitoring Data

- ◆ Comparisons to the PM_{2.5} annual standard will be based on data from community-oriented (core) monitoring locations in order to provide increased protection against the PM-related health effects found in the community-based health studies. This may involve the maximum individual core monitor or a community-wide spatial average based on eligible core sites within a community monitoring zone. Additional population-oriented monitoring stations will be located in areas reflective of the highest measured values within each metropolitan area and elsewhere throughout the State for comparison to the 24-hour standards.
- ◆ States will be divided into monitoring planning areas that in turn may contain community monitoring averaging zones. These zones are intended to contain reasonably homogenous air quality, influenced by similar sources of PM, and provide the basis for the selection of monitoring sites for community-wide air quality averaging. The designation of monitoring planning areas, community monitoring zones and core sites eligible for comparison to the annual standard, will be proposed by the State, and subject to EPA review and approval.
- ◆ Finally, in order to encourage the deployment of special purpose monitors (SPMs), today's action states that nonattainment designations will not be based on data produced at a SPM site, with any monitoring method, for the first two complete calendar years of its operation.
- ◆ The rationale for this concept is based on the need for the nation to begin

building a monitoring infrastructure from "ground zero." EPA needs to build this infrastructure because PM is a complex problem that cannot be addressed without data that will identify the sources of PM and the location of problem areas.

Data Collection and Reporting

- ◆ The ambient concentration of PM_{2.5} (total mass) will be directly compared with the standards.
- ◆ Compositional analysis is essential to understanding PM_{2.5}. In addition, chemical analysis, required at approximately 50 sites nationwide, is encouraged in monitoring areas. The EPA is also seeking funding to financially support this important monitoring activity. Following data collection, archiving collected PM_{2.5} filters will be required for 1 year. These filters will be stored for possible subsequent compositional analysis that will help identify PM emission sources and develop effective control programs.
- ◆ The concentration of the total mass of PM_{2.5} derived from the network of PM_{2.5} samplers will be reported to EPA. Although not required, the results from chemical analysis should also be reported to EPA.
- ◆ Because of the costs associated with conducting filter analysis on a routine basis, this rule only requires filters to be archived so they are available for analysis on an "as needed" basis. EPA will archive collected PM_{2.5} filters because we will need them for subsequent compositional analysis that will help identify PM emission sources and develop effective control programs. This includes: 1) whether specific monitoring sites should be designated for such analyses; 2) the criteria to be used to select sites for speciated sampling and analysis; 3) the extent and frequency to which speciation should be required by EPA for at least some monitoring stations; and 4) the need for monitoring methodologies not described in this proposal that may be needed to facilitate compositional analysis.

Quality Assurance

- ◆ EPA's standards for PM_{2.5} require great attention to achieving data of high quality with minimal imprecision and relative error. This will reduce the chance that PM_{2.5} measurements could lead to unwarranted health risk to the population when measurements underestimate true concentrations, or unnecessary control requirements when the true concentrations are over estimated.
- ◆ Enhanced quality assurance will be required in all areas relating to sampler

performance, including sampler manufacturing and sampler operation. A new operational requirement involves auditing each monitoring location using a Federal Reference Method sampler. This will ensure consistent data collection nationwide. The user agency will be required to obtain 4 collocated measurements per year with a reference method "audit" sampler for 25 percent of all routinely operating PM_{2.5} monitors. In addition, 25 percent of all PM_{2.5} samplers will be permanently collocated with a reference of equivalent PM_{2.5} sampler. Data from these audits and collocated samplers will be used to assess operating performance nationally. These data will also be used to identify reporting organizations or individual sites that have abnormal bias or precision and instruments that are not operating properly.

PM₁₀ Monitoring

- ◆ The allowed monitoring methods for PM₁₀ remain the same. The frequency of sampling will be changed to once in 3 days and the number of sampling locations are expected to be fewer because the PM_{2.5} standards will likely be the controlling standards in most situations.
- ◆ The network design and siting requirements for the annual and 24-hour PM₁₀ NAAQS will continue to emphasize identification of locations with maximum concentrations.
- ◆ The revised network will ensure continuation of the analysis of national trends in PM₁₀, maintenance of air surveillance in areas with established PM emission control programs, and protection of public health from additional growth in PM₁₀ emissions.
- ◆ PM₁₀ sites should be collocated with new PM_{2.5} sites at key population-oriented monitoring stations, so that better definition of fine and coarse contributions to PM₁₀ can be determined to provide a better understanding of exposure, emission controls, and atmospheric processes.

For More Information...

- ◆ Anyone with a computer and a modem can download the proposal and this fact sheet from the Clean Air Act Amendments bulletin board of EPA's electronic Technology Transfer Network (TTN) by calling (919) 541-5742 (look under "Recently Signed Rules"). For further information about how to access the board, call (919) 541-5384. The TTN can also be accessed through EPA's homepage on the Internet. The address is: <http://ttnwww.rtpnc.epa.gov>
- ◆ For technical questions about this proposal, contact Neil Frank at EPA's Office of Air Quality Planning and Standards at (919) 541-5560.