



# Federal Register

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**Part II**

## **Environmental Protection Agency**

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**40 CFR Parts 51 and 52**

**Proposed Rule To Implement the Fine  
Particle National Ambient Air Quality  
Standards; Proposed Rule**

## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Parts 51 and 52

[FRL-7969-1]

RIN 2060-AK74

### Proposed Rule To Implement the Fine Particle National Ambient Air Quality Standards

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Proposed rulemaking.

**SUMMARY:** This proposed rule and preamble describe the requirements that States and Tribes must meet in their implementation plans for attainment of the fine particle (PM<sub>2.5</sub>) national ambient air quality standards (NAAQS). The health effects associated with exposure to PM<sub>2.5</sub> are serious, including premature death, aggravation of heart and lung disease, and asthma attacks. Those particularly sensitive to PM<sub>2.5</sub> exposure include older adults, people with heart and lung disease, and children.

The EPA designated areas not attaining the PM<sub>2.5</sub> standards on December 17, 2004. The PM designations notice was published in the **Federal Register** on January 5, 2005 (70 FR 944) and became effective on April 5, 2005. On this same date, the Administrator signed a supplemental notice making certain changes to the designations based on 2002-2004 air quality data. The supplemental notice was published in the **Federal Register** on April 14, 2005 (70 FR 19844). A total of 39 areas with a population of 90 million were designated as nonattainment.

Within 3 years, each State having a nonattainment area must submit to EPA an attainment demonstration (and associated air quality modeling), adopted State regulations to reduce emissions of PM<sub>2.5</sub> and its precursors, and other supporting information demonstrating that the area will attain the standards as expeditiously as practicable. In order to address PM<sub>2.5</sub> problems, EPA believes that States should implement a balanced program to reduce emissions from regional sources [such as power plants emitting sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>)] and local sources (such as cars, trucks, industrial sources, and various other combustion or burning-related activities). States should take into account national, State, and local emission reduction programs that are already in place and projected to provide future air quality benefits.

**DATES:** The comment period on this proposal ends on January 3, 2006. Comments must be postmarked by the last day of the comment period and sent directly to the Docket Office listed in **ADDRESSES** (in duplicate form if possible).

One public hearing will be held prior to the end of the comment period. The dates, times and locations will be announced separately. Please refer to **SUPPLEMENTARY INFORMATION** for additional information on the comment period and public hearings.

**ADDRESSES:** Comments may be submitted by mail to: Air Docket, Environmental Protection Agency, Mail code: 6102T, 1200 Pennsylvania Ave., NW., Washington, DC 20460, Attention Docket ID No. OAR-2003-0062.

Comments may also be submitted electronically, by facsimile, or through hand delivery/courier. Follow the detailed instructions provided under **SUPPLEMENTARY INFORMATION**.

Documents relevant to this action are available for public inspection at the EPA Docket Center, located at 1301 Constitution Avenue, NW., Room B102, Washington, DC between 8:30 a.m. and 4:30 p.m., Monday through Friday, excluding legal holidays. A reasonable fee may be charged for copying.

**FOR FURTHER INFORMATION CONTACT:** Regarding PM<sub>2.5</sub> implementation issues, contact Mr. Richard Damberg, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Mail Code C504-02, Research Triangle Park, NC 27711, phone number (919) 541-5592 or by e-mail at: [damberg.rich@epa.gov](mailto:damberg.rich@epa.gov). Regarding NSR issues, contact Mr. Raj Rao, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Mail Code C339-03, Research Triangle Park, NC 27711, phone number (919) 541-5344 or by e-mail at: [rao.raj@epa.gov](mailto:rao.raj@epa.gov).

**SUPPLEMENTARY INFORMATION:** Section I of the preamble provides an overview of the PM<sub>2.5</sub> standards, health effects associated with PM<sub>2.5</sub>, legal history, and EPA's overall strategy for reducing PM<sub>2.5</sub> pollution. Section II provides an overview of the pollutants and complex atmospheric chemistry that lead to PM<sub>2.5</sub> formation, the sources of emissions, and a discussion of policy options for addressing PM precursors in the PM<sub>2.5</sub> implementation program and the new source review (NSR) program.

Section III of the preamble describes the various core elements of the PM<sub>2.5</sub> implementation program, based primarily on the subpart 1 requirements of section 172 of the Clean Air Act (CAA). Important topics discussed in

section III include attainment dates, attainment demonstrations and modeling, local emission reduction measures [reasonably available control technology (RACT) and reasonably available control measures (RACM)], and reasonable further progress (RFP). Section III also includes a subsection describing options for revising the NSR program to specifically address PM<sub>2.5</sub>. A number of other topics are presented for informational purposes in section III, including innovative program guidance, emission inventory requirements, addressing PM<sub>2.5</sub> under the transportation conformity program, stationary source test methods for PM<sub>2.5</sub>, and approaches for reducing emissions through improved monitoring techniques.

Section IV addresses the various statutory requirements and executive orders applicable to this rule. The final section contains proposed regulatory text for implementation of the PM<sub>2.5</sub> NAAQS, in the form of a proposed subpart Y amending 40 CFR part 51.

### Public Hearing

The EPA will hold one public hearing on today's proposal during the comment period. The details of the public hearing, including the time, date, and location will be provided in a future **Federal Register** notice and announced on EPA's PM<sub>2.5</sub> implementation Web site at [http://www.epa.gov/ttn/naaqs/pm/pm25\\_index.html](http://www.epa.gov/ttn/naaqs/pm/pm25_index.html).

The public hearing will provide interested parties the opportunity to present data, views, or arguments concerning the proposed rule. The EPA may ask clarifying questions during the oral presentations, but will not respond to the presentations or comments at that time. Written statements and supporting information submitted during the comment period will be considered with the same weight as any oral comments and supporting information presented at a public hearing.

### How Can I Get Copies of This Document and Other Related Information?

**Docket.** The EPA has established an official public docket for this action under Docket ID No. OAR-2003-0062. The official public docket consists of the documents specifically referenced in this action, any public comments received, and other information related to this action. Although a part of the official docket, the public docket does not include Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. The official public docket is the collection of materials that is available

for public viewing at the Air Docket in the EPA Docket Center, (EPA/DC) EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742. A reasonable fee may be charged for copying.

**Electronic Access.** You may access this **Federal Register** document electronically through the EPA Internet under the "Federal Register" listings at <http://www.epa.gov/fedrgrstr/>.

An electronic version of the public docket is available through EPA's electronic public docket and comment system, EPA Dockets. You may use EPA Dockets at <http://www.epa.gov/edocket/> to submit or view public comments, access the index listing of the contents of the official public docket, and to access those documents in the public docket that are available electronically. Once in the system, select "search," then key in the appropriate docket identification number.

Certain types of information will not be placed in the EPA Dockets. Information claimed as CBI and other information whose disclosure is restricted by statute, which is not included in the official public docket, will not be available for public viewing in EPA's electronic public docket. The EPA's policy is that copyrighted material will not be placed in EPA's electronic public docket but will be available only in printed, paper form in the official public docket. To the extent feasible, publicly available docket materials will be made available in EPA's electronic public docket. When a document is selected from the index list in EPA Dockets, the system will identify whether the document is available for viewing in EPA's electronic public docket. Although not all docket materials may be available electronically, you may still access any of the publicly available docket materials through the docket facility identified above. The EPA intends to work towards providing electronic access to all of the publicly available docket materials through EPA's electronic public docket.

For public commenters, it is important to note that EPA's policy is that public comments, whether submitted electronically or in paper, will be made available for public viewing in EPA's electronic public docket as EPA receives them and without change, unless the comment contains copyrighted material, CBI, or

other information whose disclosure is restricted by statute. When EPA identifies a comment containing copyrighted material, EPA will provide a reference to that material in the version of the comment that is placed in EPA's electronic public docket. The entire printed comment, including the copyrighted material, will be available in the public docket.

Public comments submitted on computer disks that are mailed or delivered to the docket will be transferred to EPA's electronic public docket. Public comments that are mailed or delivered to the Docket will be scanned and placed in EPA's electronic public docket. Where practical, physical objects will be photographed, and the photograph will be placed in EPA's electronic public docket along with a brief description written by the docket staff.

For additional information about EPA's electronic public docket, visit EPA Dockets online or see 67 FR 38102; May 31, 2002.

#### **How and To Whom Do I Submit Comments?**

You may submit comments electronically, by mail, by facsimile, or through hand delivery/courier. To ensure proper receipt by EPA, identify the appropriate docket identification number, OAR-2003-0062, in the subject line on the first page of your comment. Please ensure that your comments are submitted within the specified comment period. Comments received after the close of the comment period will be marked "late." The EPA is not required to consider these late comments. If you wish to submit CBI or information that is otherwise protected by statute, please follow the instructions below under, "How Should I submit CBI to the Agency?" Do not use EPA Dockets or e-mail to submit CBI or information protected by statute.

**Electronically.** If you submit an electronic comment as prescribed below, EPA recommends that you include your name, mailing address, and an e-mail address or other contact information in the body of your comment. Also include this contact information on the outside of any disk or CD ROM you submit, and in any cover letter accompanying the disk or CD ROM. This ensures that you can be identified as the submitter of the comment and allows EPA to contact you in case EPA cannot read your comment due to technical difficulties or needs further information on the substance of your comment. The EPA's policy is that EPA will not edit your comment, and any identifying or contact information

provided in the body of a comment will be included as part of the comment that is placed in the official public docket, and made available in EPA's electronic public docket. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment.

**EPA Dockets.** Your use of EPA's electronic public docket to submit comments to EPA electronically is EPA's preferred method for receiving comments. Go directly to EPA Dockets at <http://www.epa.gov/edocket/>, and follow the online instructions for submitting comments. To access EPA's electronic public docket from the EPA Internet Home Page, select "Information Sources," "Dockets," and "EPA Dockets." Once in the system, select "search," and then key in Docket ID No. OAR-2003-0062. The system is an "anonymous access" system, which means EPA will not know your identity, e-mail address, or other contact information unless you provide it in the body of your comment.

**Electronic mail.** Comments may be sent by e-mail to *A-and-R-Docket@epa.gov*, Attention Docket ID No. OAR-2003-0062. In contrast to EPA's electronic public docket, EPA's e-mail system is not an "anonymous access" system. If you send an e-mail comment directly to the Docket without going through EPA's electronic public docket, EPA's e-mail system automatically captures your e-mail address. The e-mail addresses that are automatically captured by EPA's e-mail system are included as part of the comment that is placed in the official public docket, and made available in EPA's electronic public docket.

**Disk or CD ROM.** You may submit comments on a disk or CD ROM that you mail to the mailing address identified under Docket above. These electronic submissions will be accepted in WordPerfect or ASCII file format. Avoid the use of special characters and any form of encryption.

**By Mail.** Send your comments to Air Docket (in duplicate if possible), Environmental Protection Agency, Mail code: 6102T, 1200 Pennsylvania Ave., NW., Washington, DC, 20460, Attention Docket ID No. OAR-2003-0062.

**By Hand Delivery or Courier.** Deliver your comments to: Air Docket, Environmental Protection Agency, 1301 Constitution Avenue, NW., Room B108, Mail code: 6102T, Washington, DC 20004, Attention Docket ID No. OAR-2003-0062. Such deliveries are only accepted during the Docket's normal hours of operation as identified above under Docket.

By *Facsimile*. Fax your comments to (202) 566-1741, Attention Docket ID. No. OAR-2003-0062.

### How Should I Submit CBI to the Agency?

Do not submit information that you consider to be CBI electronically through EPA's electronic public docket or by e-mail. Send or deliver information identified as CBI only to the following address: Roberto Morales, U.S. EPA, Office of Air Quality Planning and Standards, Mail Code C404-02, Research Triangle Park, NC 27711, telephone (919) 541-0880, e-mail at [morales.roberto@epa.gov](mailto:morales.roberto@epa.gov), Attention Docket ID No. OAR-2003-0062. You may claim information that you submit to EPA as CBI by marking any part or all of that information as CBI (if you submit CBI on disk or CD ROM, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is CBI). Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

In addition to one complete version of the comment that includes any information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket and EPA's electronic public docket. If you submit the copy that does not contain CBI on disk or CD ROM, mark the outside of the disk or CD ROM clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and EPA's electronic public docket without prior notice. If you have any questions about CBI or the procedures for claiming CBI, please consult the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

### What Should I consider as I Prepare My Comments for EPA?

You may find the following suggestions helpful for preparing your comments:

1. Explain your views as clearly as possible.
2. Describe any assumptions that you used.
3. Provide any technical information and/or data you used that support your views.
4. If you estimate potential burden or costs, explain how you arrived at your estimate.
5. Provide specific examples to illustrate your concerns.
6. Offer alternatives.

7. Make sure to submit your comments by the comment period deadline identified.

8. To ensure proper receipt by EPA, identify the appropriate docket identification number in the subject line on the first page of your response. It would also be helpful if you provided the name, date, and **Federal Register** citation related to your comments.

### Timing

In a number of places, this document refers to time periods (e.g., x number of years) after designation or after the designation date. By this, we mean the number of years after the effective date of PM<sub>2.5</sub> designations (April 5, 2005).

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### I. What Is the PM<sub>2.5</sub> Problem and EPA's Strategy for Addressing It?

#### A. What Are the Fine Particle Standards and the Health Effects They Address?

Fine particles in the atmosphere are made up of a complex mixture of components. Common constituents include: Sulfate (SO<sub>4</sub>); nitrate (NO<sub>3</sub>); ammonium; elemental carbon; a great variety of organic compounds; and inorganic material (including metals, dust, sea salt, and other trace elements) generally referred to as "crustal" material, although it may contain material from other sources. Airborne particulate matter (PM) with a nominal aerodynamic diameter of 2.5 micrometers or less (a micrometer is one-millionth of a meter, and 2.5

micrometers is less than one-seventh the average width of a human hair) are considered to be "fine particles," and are also known as PM<sub>2.5</sub>. "Primary" particles are emitted directly into the air as a solid or liquid particle (e.g., elemental carbon from diesel engines or fire activities, or condensable organic particles from gasoline engines). "Secondary" particles (e.g., sulfate and nitrate) form in the atmosphere as a result of various chemical reactions. (See section II for a more detailed technical discussion on PM<sub>2.5</sub>, its precursors, formation processes, and emissions sources.)

The health effects associated with exposure to PM<sub>2.5</sub> are significant. Epidemiological studies have shown a significant correlation between elevated PM<sub>2.5</sub> levels and premature mortality. Other important effects associated with PM<sub>2.5</sub> exposure include aggravation of respiratory and cardiovascular disease (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days), lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems. Individuals particularly sensitive to PM<sub>2.5</sub> exposure include older adults, people with heart and lung disease, and children. On July 18, 1997, we revised the NAAQS for particulate matter to add new standards for fine particles, using PM<sub>2.5</sub> as the indicator. We established health-based (primary) annual and 24-hour standards for PM<sub>2.5</sub> (62 FR 38652).<sup>1</sup> The annual standard is a level of 15 micrograms per cubic meter, based on the 3-year average of annual mean PM<sub>2.5</sub> concentrations. The 24-hour standard is a level of 65 micrograms per cubic meter, based on the 3-year average of the 98th percentile of 24-hour concentrations. The EPA established the standards based on significant evidence and numerous health studies demonstrating that serious health effects are associated with exposures to elevated levels of PM<sub>2.5</sub>. Estimates show that attainment of the PM<sub>2.5</sub> standards would be likely to result in tens of thousands fewer premature deaths each year, would be likely to prevent tens of thousands of hospital admissions each year, and would be likely to prevent hundreds of thousands of doctor visits, absences from work and school, and

<sup>1</sup> In the 1997 PM NAAQS revision, EPA also revised the standard for particles with a nominal aerodynamic diameter of 10 micrometers or less (also known as PM<sub>10</sub>). The original PM<sub>10</sub> standard was established in 1987. The revised PM<sub>10</sub> standard was later vacated by the court, and thus the 1987 PM<sub>10</sub> standard remains in effect. Today's proposed implementation rule and guidance does not address PM<sub>10</sub>.

respiratory illnesses in children annually. The research on which EPA based the 1997 standards did not identify a specific threshold concentration below which individuals have no PM-related health effects, meaning that emissions reductions resulting in reduced concentrations below the level of the standards may continue to provide additional health benefits to the local population.<sup>2</sup> At the time we established the primary standards in 1997, we also established welfare-based (secondary) standards identical to the primary standards. The secondary standards are designed to protect against major environmental effects of PM<sub>2.5</sub> such as visibility impairment, soiling, and materials damage. The EPA also established the regional haze regulations in 1999 for the improvement of visual air quality in national parks and wilderness areas across the country. Because regional haze is caused primarily by light scattering and light absorption by fine particles in the atmosphere, EPA is encouraging the States to integrate their efforts to attain the PM<sub>2.5</sub> standards with those efforts to establish reasonable progress goals and associated emission reduction strategies for the purposes of improving air quality in our treasured natural areas under the regional haze program.

The scientific assessment that resulted in the establishment of the PM<sub>2.5</sub> standards included a scientific peer review and public comment process. We developed scientific background documents based on the review of hundreds of peer-reviewed scientific studies. The Clean Air Scientific Advisory Committee, a congressionally mandated group of independent scientific and technical experts, provided extensive review of these assessments, and found that EPA's review of the science provided an adequate basis for the EPA Administrator to make a decision. More detailed information on health effects of PM<sub>2.5</sub> can be found on EPA's Web site at: <http://www.epa.gov/air/urbanair/pm/index.html>. Additional information on EPA's scientific assessment documents supporting the 1997 standards is available at: <http://www.epa.gov/ttn/oarpg> (see headings for "Staff Papers" and "Criteria Documents").

<sup>2</sup> Environmental Protection Agency. (1996) Air Quality Criteria for Particulate Matter. Research Triangle Park, NC: National Center for Environmental Assessment-RTP Office; report no. EPA/600/P-95/001aF-cf. 3v.

### *B. What Is the Legal History of the PM<sub>2.5</sub> Standards?*

After EPA promulgated the PM<sub>2.5</sub> and 8-hour ozone standards in July 1997, several industry organizations and State governments challenged EPA's action in the U.S. Court of Appeals for the District of Columbia Circuit (the DC Circuit). This action initiated a long legal process, ending with a March 2002 decision by the DC Circuit upholding the standards and the authority on which they were established.

On May 14, 1999, the three-judge panel of the DC Circuit held in a split decision that the CAA, as applied by EPA in setting the 1997 standards for PM and ozone, was unconstitutional as an improper delegation of legislative authority to EPA. The ruling did not question the science or decision-making process used to establish the standards. The Court remanded the PM<sub>2.5</sub> standards to EPA but did not vacate them. In June 1999, the Department of Justice (DOJ) and EPA petitioned the Court for a rehearing en banc with the entire DC Circuit Court. On October 29, 1999, the Court denied the petition for rehearing.

The DOJ and EPA then filed a petition for certiorari with the United States Supreme Court in December 1999 to appeal the decision of the DC Circuit, and the Supreme Court issued its decision to hear the appeal in November 2000. The Supreme Court issued its decision on the merits of the appeal on February 27, 2001.<sup>3</sup> In that decision, the Supreme Court held that EPA's approach to setting the NAAQS in accordance with the CAA did not constitute an unconstitutional delegation of authority. The Supreme Court unanimously affirmed the constitutionality of the CAA provision that authorizes the Agency to set national air quality standards, stating that this provision "fits comfortably within the scope of discretion permitted by our precedent." The Supreme Court also affirmed that the CAA requires EPA to set standards at levels necessary to protect the public health and welfare, without considering the economic costs of implementing the standards. The Supreme Court remanded several other issues back to the DC Circuit, including the issue of whether EPA acted arbitrarily and capriciously in establishing the specific levels of the standards.

The DC Circuit heard arguments in this remanded case in December 2001, and issued its decision on March 26, 2002. The DC Circuit found that the

Agency had "engaged in reasoned decision making," rejecting the claim that the Agency had acted arbitrarily and capriciously in setting the levels of the standards. This last decision by the DC Circuit gave EPA a clear path to move forward with implementation of the PM<sub>2.5</sub> standards.

The implementation rule we are proposing today provides specific requirements for State, local, and Tribal<sup>4</sup> air pollution control agencies to address as they prepare implementation plans required by the CAA to attain and maintain the PM<sub>2.5</sub> standards.<sup>5</sup> Each State with an area that is not attaining the PM<sub>2.5</sub> NAAQS will have to develop, as part of its State implementation plan (SIP), emission limits for appropriate sources and other requirements to attain the NAAQS within the timeframes set forth in the CAA.<sup>6</sup> Tribes with jurisdiction over Indian country that is not attaining the PM<sub>2.5</sub> NAAQS could voluntarily submit a Tribal implementation plan (TIP) but are not required to do so. However, in cases where Tribes elect not to submit a TIP, EPA, working with the Tribes, has the responsibility for developing an implementation plan in those areas.

### *C. What Was the Process for Designating PM<sub>2.5</sub> Attainment and Nonattainment Areas?*

We issued guidance in April 2003<sup>7</sup> and February 2004<sup>8</sup> on the process for designating attainment and nonattainment areas for PM<sub>2.5</sub> and on factors for States and Tribes to consider in defining boundaries for nonattainment areas. The guidance states that EPA believes the presumptive boundaries for nonattainment areas

<sup>4</sup> The 1998 Tribal Authority Rule (TAR) (40 CFR part 49), which implements section 301(d) of the CAA, provides for Tribes to be treated in the same manner as a State in implementing sections of the CAA. It gives Tribes the option of developing tribal implementation plans (TIPs), but unlike States, Tribes are not required to develop implementation plans. See section III.Q. for further discussion of Tribal issues.

<sup>5</sup> When the term "State" is used hereafter, it will refer to States, local air agencies, and Tribal governments electing to be treated as States for the purposes of implementing the CAA.

<sup>6</sup> The CAA requires EPA to set ambient air quality standards and requires States to submit plans designed to attain those standards.

<sup>7</sup> See "Designations for the Fine Particle National Ambient Air Quality Standard," memorandum from Jeffrey R. Holmstead, Assistant Administrator, to EPA Regional Administrators, April 1, 2003. Available at: <http://www.epa.gov/pmdesignations/guidance.htm>.

<sup>8</sup> See "Additional Guidance on Defining Area Boundaries for PM<sub>2.5</sub> Designations," memorandum from Lydia N. Wegman, Director of Air Quality Strategies and Standards Division, EPA Office of Air Quality Planning and Standards, to EPA Air Division Directors, February 12, 2004. Available at: <http://www.epa.gov/pmdesignations/guidance.htm>.

should be equal to the 1999 Office of Management and Budget (OMB) definitions of the combined metropolitan statistical area, where applicable, or the metropolitan statistical area. We also recognized the fact that in June 2003, OMB released updated definitions of combined statistical areas and core-based statistical areas. We communicated to the States and Tribes that in evaluating potential nonattainment area boundaries, they should include any additional counties that were added in 2003 to the 1999 metro area definitions, plus adjacent counties, in their review of data associated with the nine technical factors discussed in EPA guidance.

States were required to submit their recommendations to EPA by February 15, 2004.<sup>9</sup> Tribes were encouraged, but not required, to submit designation recommendations to EPA for their reservations or other areas under their jurisdiction. In general, the recommendations were based on the most recent 3 years of air quality data available (e.g. 2001–2003). On June 29, we sent letters to the Governors and Tribal leaders notifying them of any modifications we intended to make to their recommendations. After considering additional comments and information from States and Tribes, EPA issues final PM<sub>2.5</sub> designations on December 17, 2004. They were published in the **Federal Register** on January 5, 2005 (70 FR 944).

The nonattainment designation for an area starts the process whereby a State or Tribe must develop an implementation plan that includes, among other things, a demonstration showing how it will attain the ambient standards by the attainment dates required in the CAA. Under section 172(b), States have up to 3 years after EPA's final designations to submit their SIPs to EPA. These SIPs will be due in April 2008, three years from the effective date of the designations.

### *D. What Is the Geographic Extent of the PM<sub>2.5</sub> Problem?*

The PM<sub>2.5</sub> ambient air quality monitoring data for the 2001–2003 period suggest that areas violating the standards are located across much of the eastern half of the United States and in much of central and southern California.

<sup>9</sup> The Consolidated Appropriations Bill for FY2004 (Pub. L. 108–199), signed by President Bush on January 23, 2004, codifies the required State submittal date (February 15, 2004) and the date for EPA to finalize PM<sub>2.5</sub> designations (December 31, 2004) that were originally included in EPA's April 2003 guidance on PM<sub>2.5</sub> designations.

<sup>3</sup> *Whitman v. American Trucking Assoc.*, 121 S.Ct. 903, 911–914 (2001) (Whitman).

A total of 47 areas comprised of 224 counties and the District of Columbia were designated as nonattainment in December 2004. In April 2005, EPA issued a supplemental notice which changed the designation status of eight areas (with 17 counties) from nonattainment to attainment based on newly updated 2002–2004 air quality data. In addition, four areas previously designated as unclassifiable were changed to attainment in this notice.

The population of the 39 PM<sub>2.5</sub> nonattainment areas is significant—about 90 million, or more than 30% of the U.S. population. Most areas violate only the annual standard, but a few violate both the annual and 24-hour standards. The 2001–2003 data show that no area violates just the 24-hour standard.<sup>10</sup>

The distribution of the 2001–2003 design values<sup>11</sup> for the 39 nonattainment areas is shown in the table below:

Design value range for PM <sub>2.5</sub> nonattainment areas (in µg/m <sup>3</sup> )	Number of areas	Percent of all areas (percent)
15.1–16.0 .....	10	26
16.1–17.0 .....	12	31
17.1–18.0 .....	12	31
18.1–19.0 .....	1	3
19.1 + .....	4	10
Total .....	39	100

More than 40% of the nonattainment areas, including many major metropolitan areas, have design values that are 2 µg/m<sup>3</sup> or more above the annual standard.

The EPA believes the PM<sub>2.5</sub> problem has a substantial regional component because the formation and transport of secondarily formed particles, such as sulfates and nitrates, extends over hundreds of miles. The regional nature of PM<sub>2.5</sub> is in contrast to the more localized nature of PM<sub>10</sub>.

In addition, data suggests that ambient PM<sub>2.5</sub> concentrations tend to rise and fall in a consistent manner across very large geographic areas. The transport phenomena associated with PM<sub>2.5</sub> and its precursors has been well-documented for many years. For example, one significant source of information on long-range transport is the National Acid Precipitation

Assessment Program (NAPAP) research from the 1980's and its associated reports published in 1991.<sup>12</sup> Additional studies and air quality modeling analyses since that time have added to the body of information documenting the regional nature of PM<sub>2.5</sub>.<sup>13</sup> Since the emissions from one State may contribute significantly to PM<sub>2.5</sub> violations in several other States, we believe that plans to attain the PM<sub>2.5</sub> standards will need to include a combination of national, regional, and local emission reduction strategies.

#### *E. What Is EPA's Overall Strategy for Reducing PM<sub>2.5</sub> Pollution?*

Our overall strategy for achieving the PM<sub>2.5</sub> standards is based on the structure outlined in the CAA. The CAA outlines important roles for State and Tribal governments and for EPA in implementing national ambient air quality standards.

States have primary responsibility for developing and implementing SIPs that contain local and in-State measures needed to achieve the air quality standards in each area. We assist States and Tribes by providing technical tools, assistance and guidance, including information on control measures. In addition, we set national emissions limits for some sources such as new motor vehicles, certain categories of major new sources, and existing stationary sources of toxic air pollutants. Where upwind sources (such as coal-fired power plants) contribute to downwind problems in other States or Tribes, we can also ensure that the upwind States address these contributing emissions, or we can put in place Federal regulations in situations where the upwind States fail to address these sources. We intend to work closely with States and Tribes to use an appropriate combination of national, regional, and local pollution reduction measures to meet the standards as expeditiously as practicable, as required by the CAA.

<sup>12</sup> National Acid Precipitation Assessment Program. Acid Deposition: State of the Science and Technology. Washington, DC. 1991. See also: Environmental Protection Agency. (2004) Air Quality Criteria for Particulate Matter. Research Triangle Park, NC: Office of Research and Development; report no. EPA/600/P-99/002a,bF. October. The 2004 PM criteria document is available at: [http://www.epa.gov/ttn/naaqs/standards/pm/s\\_pm\\_cr\\_cd.html](http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_cr_cd.html).

<sup>13</sup> NARSTO (2004) Particulate Matter Assessment for Policy Makers: A NARSTO Assessment. P. McMurry, M. Shepherd, and J. Vickery, eds. Cambridge University Press, Cambridge, England. ISBN 0 52 184287 5. For more information, see <http://www.cgenv.com/NARSTO>. See also supporting technical information for the Clear Skies Act, <http://www.epa.gov/clearskies/>, and for the Clean Air Interstate Rule, <http://www.epa.gov/cleanairinterstaterule>.

#### 1. The State Implementation Plan (SIP) System

A SIP is the compilation of regulations and programs that a State uses to carry out its responsibilities under the CAA, including the attainment, maintenance, and enforcement of NAAQS. (Only certain air quality programs and regulations implemented by States are required to be part of the SIP, however.) States use the SIP process to identify the emissions sources that contribute to the nonattainment problem in a particular area, and to select the emissions reduction measures most appropriate for that area, considering technical and economic feasibility, and a variety of local factors such as population exposure, enforceability, and economic impact. Under the CAA, SIPs must ensure that areas reach attainment as expeditiously as practicable. These plans need to take into consideration emission reductions resulting from national programs (such as mobile source regulations, the acid rain program, or maximum achievable control technology (MACT) standards for air toxics) as well as from State or local programs not directly mandated under the CAA.

The SIP system for nonattainment areas is an important component of the CAA's overall strategy for meeting the PM<sub>2.5</sub> standards, but it is not the only component. As noted below, the CAA also includes requirements for national rules or programs that will reduce emissions and help achieve cleaner air.

#### 2. National Rules

For the States to be successful in developing local plans showing attainment of standards, we must do our part to develop standards and programs to reduce emissions from sources that are more effectively and efficiently addressed at the national level. We also have the responsibility to ensure that interstate transport is addressed through SIPs or other means. As outlined below, we have issued final regulations that will achieve important emissions reductions from power plants, onroad and nonroad engine sources, and other sources that may enable some areas to meet the PM<sub>2.5</sub> standards in the near term and make it easier for others to attain.

The acid rain program, authorized under title IV of the 1990 CAA amendments, was projected to reduce annual SO<sub>2</sub> emissions by 10 million tons from 1980 levels by 2010, and to reduce annual NO<sub>x</sub> emissions by 2 million tons from 1980 levels by 2010. The EPA has implemented the acid rain

<sup>10</sup> A listing of counties and associated PM<sub>2.5</sub> 3-year annual average concentrations, or "design values," is available on EPA's Web site at: <http://www.epa.gov/airtrends/values.html>.

<sup>11</sup> The PM<sub>2.5</sub> design value for a nonattainment area is the highest of the 3-year average concentrations calculated for the monitors in the area, in accordance with 40 CFR part 50, appendix N.



program in two phases: Phase I for SO<sub>2</sub> began in 1995 and targeted the largest and highest-emitting coal-fired power plants. Phase I for NO<sub>x</sub> began in 1996. Phase II for both pollutants began in 2000 and sets restrictions on Phase I plants as well as many additional smaller coal-, gas-, and oil-fired plants. Over 2,000 sources (mostly electricity generating facilities) are now affected by the Acid Rain Program. The acid rain emissions trading system had a cap of 8.95 million tons on the total amount of SO<sub>2</sub> that may be emitted by power plants nationwide, about half the amount emitted in 1980. Sulfate particles formed from SO<sub>2</sub> emissions and nitrate particles formed from NO<sub>x</sub> emissions contribute significantly to total PM<sub>2.5</sub> mass in the eastern U.S. (ranging from 30–50 percent), so the reductions already achieved under the Acid Rain Program have led to improvements in PM<sub>2.5</sub> concentrations across the region.

Additional reductions in NO<sub>x</sub> emissions from power plants and large industrial sources were required by May 2004 under our rules to reduce interstate transport of ozone pollution in the eastern U.S. These rules are known as the NO<sub>x</sub> SIP Call, published October 27, 1998 (63 FR 57356), and the Section 126 Rule, published May 25, 1999 (64 FR 28250). We estimate that when fully implemented, this program will result in the reduction of more than one million tons of summertime NO<sub>x</sub>. While this program was established primarily to address the ground-level ozone problem in the East, it will also result in reduced ambient levels of nitrate, one of the main components of PM<sub>2.5</sub>.

The Administration has proposed nationwide legislation—the Clear Skies Act<sup>14</sup>—to address health and environmental concerns associated with power plant emissions of sulfur dioxide, nitrogen oxides, and mercury. However, because passage of the CSA legislation is not assured, EPA has established the Clean Air Interstate Rule (CAIR),<sup>15</sup> a regulatory approach to address interstate transport of pollution under section 110 of the CAA. Section 110 gives EPA the authority to require SIPs to “prohibit \* \* \* any source or other type of emission activity within the State from emitting any air pollutant in amounts which will contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to” any NAAQS, and to prohibit sources or

emission activities from emitting pollutants in amounts which will interfere with measures required to be included in State plans to prevent significant deterioration of air quality or to protect visibility (such as the protection of 156 mandatory Federal class I areas under the regional haze rule<sup>16</sup>).

CAIR, issued by EPA on March 10, 2005, employs the same emissions trading approach used to achieve cost-effective emission reductions under the acid rain program. It outlines a two-phase program with declining power plant emissions caps for 28 eastern states and the District of Columbia: SO<sub>2</sub> caps of 3.6 million tons in 2010, and 2.5 million in 2015; NO<sub>x</sub> caps of 1.5 in 2009 and 1.3 in 2015; and NO<sub>x</sub> ozone season caps of 580,000 tons in 2009 and 480,000 tons in 2015. Emission caps are divided into State SO<sub>2</sub> and NO<sub>x</sub> budgets. By the year 2015, the Clean Air Interstate Rule will result in:

- \$85 to \$100 billion in annual health benefits, annually preventing 17,000 premature deaths, millions of lost work and school days, and tens of thousands of non-fatal heart attacks and hospital admissions.
- Nearly \$2 billion in annual visibility benefits in southeastern national parks, such as Great Smoky and Shenandoah.
- Significant regional reductions in sulfur and nitrogen deposition, reducing the number of acidic lakes and streams in the eastern U.S.

Current emissions standards for new cars, trucks and buses are reducing motor vehicle emissions of volatile organic compounds (VOCs, also referred to as hydrocarbons), NO<sub>x</sub>, and direct PM emissions (such as elemental carbon) as older vehicles are retired and replaced. Other existing rules are reducing emissions from several categories of nonroad engines. The Tier 2 motor vehicle emission standards, together with the associated requirements to reduce sulfur in gasoline, will provide additional benefits nationally beginning in 2004.<sup>17</sup> When the new tailpipe and sulfur standards are fully implemented, Americans will benefit from the clean-air equivalent of removing 164 million cars from the road.

These new standards require passenger vehicles to have emissions 77 to 95 percent cleaner than those on the road today and reduce the sulfur content of gasoline by up to 90 percent. In addition, the 2001 heavy-duty diesel

engine regulations<sup>18</sup> will lead to continued emissions reductions as older vehicles in that engine class are retired and fleets turn over. New emission standards will begin to take effect in model year 2007 and will apply to heavy-duty highway engines and vehicles. These standards are based on the use of high-efficiency catalytic exhaust emission control devices or comparably effective advanced technologies. Because these devices are damaged by sulfur, the level of sulfur in highway diesel fuel will be reduced by 97 percent by mid-2006. We project a 2.6 million ton reduction of NO<sub>x</sub> emissions in 2030 when the current heavy-duty vehicle fleet is completely replaced with newer heavy-duty vehicles that comply with these emission standards. By 2030, we estimate that this program will reduce annual emissions of hydrocarbons by 115,000 tons and PM by 109,000 tons. These emissions reductions are on par with those that we anticipate from new passenger vehicles and low sulfur gasoline under the Tier 2 program.

EPA also finalized national rules in May 2004 to significantly reduce PM<sub>2.5</sub> and NO<sub>x</sub> emissions from nonroad diesel-powered equipment.<sup>19</sup> These nonroad sources include construction, agricultural, and industrial equipment, and their emissions constitute an important fraction of the inventory for direct PM<sub>2.5</sub> emissions (such as elemental carbon and organic carbon), and NO<sub>x</sub>. The EPA estimates that affected nonroad diesel engines currently account for about 44 percent of total diesel PM emissions and about 12 percent of total NO<sub>x</sub> emissions from mobile sources nationwide. These proportions are even higher in some urban areas. The diesel emission standards will reduce emissions from this category by more than 90 percent, and are similar to the onroad engine requirements implemented for highway trucks and buses. Because the emission control devices can be damaged by sulfur, EPA also established requirements to reduce the allowable level of sulfur in nonroad diesel fuel by more than 99 percent by 2010. In 2030, when the full inventory of older nonroad engines has been replaced, the nonroad diesel program will annually prevent up to 12,000 premature deaths, one million lost work days, 15,000 heart attacks and 6,000 children’s asthma-related emergency room visits.

<sup>18</sup> See heavy-duty diesel engine regulations at 66 FR 5002, January 18, 2001.

<sup>19</sup> For more information on the proposed nonroad diesel engine standards, see EPA’s website: <http://www.epa.gov/nonroad/>.

<sup>14</sup> For more information on the proposed Clear Skies Act, see EPA’s website: <http://www.epa.gov/clearskies/>.

<sup>15</sup> See <http://www.epa.gov/cair>.

<sup>16</sup> See 64 FR 35714, July 1, 1999.

<sup>17</sup> See Tier II emission standards at 65 FR 6698, February 10, 2000.

## II. Fine Particles: Overview of Atmospheric Chemistry, Sources of Emissions, and Ambient Monitoring Data

### A. Introduction

Particulate matter is a chemically and physically diverse mixture of discrete solid particles and liquid droplets. It exists in the air in a range of particle sizes, from submicrometer to more than 30 micrometers in size. The composition of particles varies throughout this range of sizes, depending on the age of the particle, the nature of the source of pollutant emissions, and the source's operating characteristics.

This regulation focuses on reducing ambient concentrations of the PM<sub>2.5</sub> size fraction of PM. The term PM<sub>2.5</sub> is used to describe the fraction of particles whose nominal aerodynamic diameter is less than or equal to 2.5 micrometers. PM<sub>2.5</sub> in the ambient air is defined operationally as the set of particles measured (and associated concentration) by the Federal Reference Method sampling device. Since the cut point of this sampling device is not perfectly sharp, some particles smaller than 2.5 micrometers are not retained and some particles larger than 2.5 micrometers are captured by sampling devices. This is important because there are two relevant modes to the PM size distribution, fine PM (nominally PM<sub>2.5</sub>) and coarse PM (nominally from 2.5 to 10 micrometers aerodynamic diameter). These modes overlap slightly, but they are generally associated with distinctly different source types and formation processes.

Fine particles emitted directly into the air in a stable solid or liquid chemical form are referred to as "primary" particles. Particles formed near their source by condensation processes in the atmosphere are also considered to be primary particles. PM<sub>2.5</sub> that is formed by chemical reactions of gases in the atmosphere is considered to be "secondarily" formed particulate matter.

PM<sub>2.5</sub> in the atmosphere is composed of a complex mixture of constituents: Sulfate; nitrate; ammonium; particle-bound water; black carbon (also known as elemental carbon); a great variety of organic compounds; and miscellaneous inorganic material (sometimes called "crustal material," which includes geogenic dust and metals). Atmospheric PM<sub>2.5</sub> also contains a large number of

elements in various compounds and concentrations. Some organic materials such as pollen, spores, and plant detritus are also found in both the fine and coarse particle modes but from different sources or mechanisms. Crustal materials such as calcium, aluminum, silicon, magnesium, and iron are found predominantly in coarse mode particles. Nitrate is generally found in the fine particle mode, but it is also found in the coarse mode particles, coming primarily from the reaction of gas-phase nitric acid with preexisting coarse particles.

Primary coarse particles are usually formed by mechanical processes. This includes material emitted from such sources as wind-blown dust, road dust, and particles formed by abrasion, crushing, and grinding. Some combustion-generated particles such as fly ash and soot also are found in the coarse mode. Primary PM<sub>2.5</sub> includes soot from diesel engines, a wide variety of organic compounds condensed from incomplete combustion or cooking operations, and compounds such as arsenic, selenium, and zinc that condense from vapor formed during combustion or smelting. The concentration of primary PM<sub>2.5</sub> in the air depends on source emission rates, transport and dispersion, and removal rate from the atmosphere.

Secondary PM is formed by chemical reactions of gas-phase precursors in the atmosphere. These reactions form condensable vapors that either form new particles or condense onto other particles in the air. Most of the sulfate and nitrate and a portion of the organic compounds in the atmosphere are formed by such chemical reactions. Secondary PM formation depends on numerous factors including the concentrations of precursors; the concentrations of other gaseous reactive species such as ozone, hydroxyl radicals, peroxy radicals, or hydrogen peroxide; atmospheric conditions including solar radiation, temperature, and relative humidity (RH); and the interactions of precursors and pre-existing particles with cloud or fog droplets or in the liquid film on solid particles. Several atmospheric aerosol species, such as ammonium nitrate and certain organic compounds, are semivolatile and are found in both gas and particle phases. Given the complexity of PM formation processes, new information from the scientific community continues to emerge to

improve our understanding of the relationship between sources of PM precursors and secondary particle formation.

Certain particles, such as sulfates, nitrates, and certain organics, readily take up water and are considered to be hygroscopic. As a result of the equilibrium of water vapor with liquid water in hygroscopic particles, many ambient particles contain some amount of liquid water. When filter samples are weighed at lower relative humidity levels according to the PM<sub>2.5</sub> Federal reference method specifications, the filters are desiccated and much of this water is removed, but some particle-bound water will be measured as a component of the particle mass. Particle-bound water in the ambient air increases with higher relative humidities. This phenomenon is important because it affects the size of certain particles, and in turn, their properties of light scattering and aerodynamics. Differences in relative humidity can result in different measured particle size distributions, mass concentrations, and resulting visibility impairment levels. Regional emission reduction strategies to reduce PM<sub>2.5</sub>, particularly hygroscopic particles such as sulfates and nitrates, should also provide significant visibility improvements, both in urban areas and in federal class I areas (national parks and wilderness areas).

The following discussion elaborates on the relationship between source types and the composition of PM<sub>2.5</sub>. More information and references on the composition of PM may be found in the EPA 2004 PM Air Quality Criteria Document.<sup>20</sup>

### B. Concentration, Composition and Sources of Fine PM

The relative contribution of PM<sub>2.5</sub> components varies significantly by region of the country. Data on PM<sub>2.5</sub> composition primarily in urban areas is available from the EPA Speciation Trends Network beginning in 2001. PM<sub>2.5</sub> composition data for primarily rural areas (e.g. national parks and wilderness areas) is available from the IMPROVE visibility monitoring network beginning in 1988. Speciation data from September 2001 to August 2002 are summarized for urban and rural areas in nine regions in table 2.

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<sup>20</sup> Environmental Protection Agency. (2004) Air Quality Criteria for Particulate Matter. Research Triangle Park, NC: Office of Research and

Development; report no. EPA/600/P-99/002a,bF. October. The 2004 PM criteria document is

available at: [http://www.epa.gov/ttn/naaqs/standards/pm/s\\_pm\\_cr\\_cd.html](http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_cr_cd.html).

TABLE 2. PM<sub>2.5</sub> CHEMICAL COMPOSITION DATA, SEPTEMBER 2001 - AUGUST 2002

REGION (# sites)	URBAN SITES							RURAL SITES								
	Metric	Estimated			Total			URBAN TOTAL	Sulfate	Estimated			Total			RURAL TOTAL
		Sulfate	Ammonium	Nitrate	Mass	Carbon	Crustal Material			Sulfate	Ammonium	Nitrate	Mass	Carbon	Crustal Material	
<b>Southeast</b> (8 urban/11 rural)	Mass	4.0	1.7	0.7	5.1	0.6	12.1	3.2	1.4	0.4	2.8	0.5	8.3			
	%	33%	14%	6%	42%	5%	100%	39%	17%	5%	34%	6%	100%			
<b>Midwest</b> (8 urban/7 rural)	Mass	4.1	2.1	2.6	5.2	0.7	14.7	4.2	1.8	1.1	2.8	0.7	10.6			
	%	28%	14%	18%	35%	5%	100%	40%	17%	10%	26%	7%	100%			
<b>East Coast</b> (10 urban/8 rural)	Mass	4.5	2.3	2.0	6.2	0.6	15.6	4.1	1.6	0.7	3.1	0.5	10.0			
	%	29%	15%	13%	40%	4%	100%	41%	16%	7%	31%	5%	100%			
<b>California</b> (5 urban, 14 rural)	Mass	1.9	2.7	7.0	9.5	1.0	22.1	0.8	0.4	0.4	2.1	0.6	4.3			
	%	9%	12%	32%	43%	5%	100%	19%	9%	9%	49%	14%	100%			
<b>Desert-West</b> (5 urban/29 rural)	Mass	1.3	0.8	1.0	6.1	1.5	10.7	0.7	0.3	0.2	1.2	1.3	3.7			
	%	12%	7%	9%	57%	14%	100%	19%	8%	5%	32%	35%	100%			
<b>Northwest</b> (2 urban/17 rural)	Mass	1.2	0.7	0.8	4.4	0.4	7.5	0.4	0.3	0.2	1.7	0.4	3.0			
	%	16%	9%	11%	59%	5%	100%	13%	10%	7%	57%	13%	100%			
<b>East Texas/South</b> (3 urban/3 rural)	Mass	3.3	1.6	1.1	4.2	0.9	11.1	3.0	1.4	0.8	2.4	0.8	8.4			
	%	30%	14%	10%	38%	8%	100%	36%	17%	10%	29%	10%	100%			
<b>Far North East</b> (2 urban/11 rural)	Mass	2.7	1.3	1.1	4.3	0.4	9.8	2.1	0.9	0.4	2.3	0.3	6.0			
	%	28%	13%	11%	44%	4%	100%	35%	15%	7%	38%	5%	100%			
<b>North Plains</b> (2 urban/17 rural)	Mass	1.8	1.2	1.9	3.0	0.6	8.5	0.7	0.4	0.2	1.5	0.5	3.3			
	%	21%	14%	22%	35%	7%	100%	21%	12%	6%	45%	15%	100%			

Source: EPA Speciation Trends Network, IMPROVE visibility monitoring network

**Notes:**

1. All units are in micrograms/cubic meter. All mass numbers represent median annual average values for the time period September 2001–A
2. All sites included in analyses had complete data for this time period as defined by 50% or more observations per quarter for all major chem
3. All Ammonium concentrations are estimated from a 'fully-neutralized' assumption of ammonium sulfate and ammonium nitrate.
4. The regions are defined as follows:

South East: AL, SC, NC, LA, MS, TN, FL, GA

Mid West: IL, IN, Eastern IA, Southern MI, South-Eastern WI, MO, OH, KY

East Coast/North East: DC, MD, NJ, NY, Northern VA, PA, Northern WV

CA: All of CA

Desert West: Eastern AZ, CO, NV, UT, Western TX, NM

North West: WA, OR, ID

East Texas, South: Dallas, Houston, AK, Southern OK

Far North East: ME, VT, NH, Upstate NY

North Plains: MN, Dakotas, Upper MI, MT, WY

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This discussion focuses on the eastern U.S. and California since most nonattainment areas will be located in those regions. In general, urban areas have higher annual average PM<sub>2.5</sub> concentrations than nearby rural areas. In the eastern U.S. urban areas, ammonium sulfate and total carbon (comprised of black carbon and organic carbon) are the dominant species, each accounting for 30–40 percent of total reconstructed mass in most locations. (Reconstructed mass is the PM mass

calculated by adding together the mass from each of the main components of PM as obtained from chemical composition monitoring.) Nitrate plus associated ammonium ion is a more significant component of PM mass in northern regions, such as the midwest and east coast, but is a less significant fraction in the southeast. In California, the main species contributing to urban PM<sub>2.5</sub> mass are ammonium nitrate (35–40 percent) and total carbon (43 percent), while sulfate and associated

ammonium accounts for approximately 10–15 percent.

Table 3 compares chemical composition data for 13 pairs of urban and nearby non-urban sites in order to identify the primary components that make up the "urban increment." To conduct this analysis, for each species the PM<sub>2.5</sub> mass in the rural location is subtracted from the species mass for the urban location. The amount by which the urban site exceeds the nearby rural site is the "urban increment."<sup>21</sup>

<sup>21</sup> V. Rao, N. Frank, A. Rush, F. Dimmick, "Chemical Speciation of PM<sub>2.5</sub> in Urban and Rural

Areas," In the Proceedings of the Air & Waste Management Association Symposium on Air

Quality Measurement Methods and Technology, San Francisco, November 13–15, 2002.

TABLE 3.—URBAN INCREMENT ANALYSIS FOR 13 URBAN/RURAL PAIRS

[All values in micrograms per cubic meter]

Chemical species	West (3 site pairs)			East (10 site pairs)		
	Min.	Max.	Avg.	Min.	Max.	Avg.
Sulfate .....	0.2	0.7	0.5	-0.5	1.1	0.3
Est. Ammonium .....	0.2	2.2	1.2	0.1	0.8	0.4
Nitrate .....	0.6	6.9	3.7	0.4	1.4	0.8
Total Carbon .....	4.8	9.8	6.6	2.1	5.3	3.1
Crustal .....	0.1	0.6	0.4	-0.1	0.8	0.3
<b>Total Excess .....</b>	<b>5.8</b>	<b>20.1</b>	<b>12.4</b>	<b>2.0</b>	<b>9.4</b>	<b>4.8</b>

Carbonaceous mass is the largest contributor to urban increments in all regions of the country. In east coast and midwestern urban areas, carbon can account for as much as 70–90 percent of the total urban increment. The highest local increment of carbon as calculated from available data appears to be about 10  $\mu\text{g}/\text{m}^3$  in Fresno, CA. Nonroad diesel, onroad diesel, gasoline highway vehicles, and fire related activities are regarded to be important major contributors to this urban excess of carbon. The relative amounts of primary versus secondary organic compounds in the ambient air vary with location and time of year. While it is difficult to generalize, it is clear that both primary and secondary organic compounds are significant contributors to ambient  $\text{PM}_{2.5}$  mass in many parts of the country.

The urban increment for sulfate, on the other hand, appears to be fairly low in most locations. Rural and urban sulfate levels are often very similar, indicating that sulfate is a regional pollutant that can be transported long distances. This is consistent with the fact that power plants are the principal sources of  $\text{SO}_2$ , the precursor to sulfate, and in general, these plants are located outside urban core areas. In some eastern cities, the small estimated urban excess (up to 0.5  $\mu\text{g}/\text{m}^3$ ) may be attributed to a range of source types, including power plants located within the metro area, the combustion of sulfur-laden fuel oil used for commercial or institutional heating, and fuel combustion by diesel and gasoline motor vehicles.

Excess nitrate concentrations are observed predominantly in northern, midwestern, and western locations, comprising a larger local contribution than sulfate or crustal material. Nitrate is particularly high in the winter time partly because it is less volatile at colder temperatures and partly because  $\text{SO}_2$  is less prone to react preferentially with ammonium in the winter as opposed to the summer. Local sources of  $\text{NO}_x$

leading to excess urban nitrate likely include mobile sources and other types of fuel combustion.

Some locations also show a small urban excess of crustal material (e.g. inorganic material including metals, dust, sea salt, and other trace elements). The estimation procedure used in the IMPROVE protocol includes the measurement of iron and other trace elements. Therefore, this difference also reflects oxidized particulate metals, some of which may be attributed to road dust or industrial sources in urban areas.

We have developed a National Emissions Inventory (NEI) inventory for use in analyzing trends in emissions, conducting various regulatory analyses for PM, and for use in regional scale modeling.<sup>22</sup> The NEI covers all 50 States plus some of the U.S. territories, and includes point, area, onroad and nonroad mobile sources, biogenic, and geogenic emissions. Large stationary sources are located individually in the inventory while county tallies are used for smaller stationary sources, and area and mobile source category groups. Spatial, temporal and compositional profiles are used to allocate these emissions to time-resolved grids for chemical transport modeling. The inventory includes emissions of  $\text{SO}_2$ ,  $\text{NO}_x$ , VOC,  $\text{NH}_3$ ,  $\text{PM}_{10}$ , and  $\text{PM}_{2.5}$ . A brief discussion of each particle type, their principal sources (based on the NEI), formation mechanisms, and spatial and temporal patterns follows.

*Primary PM (Crustal and Carbonaceous).* This section addresses inorganic and organic forms of primary PM. The main anthropogenic sources of inorganic (or crustal) particles are: Entrainment by vehicular traffic on

unpaved or paved roads; mechanical disturbance of soil by highway, commercial, and residential construction; and agricultural field operations (tilling, planting and harvesting). However, much of these emissions are coarse PM rather than fine PM.

Industrial processes such as quarries, minerals processing, and agricultural crop processing can also emit crustal materials, but their influence is most important close to the source and they are not generally significant contributors to regional scale PM problems. Even so, during certain high wind events, fine crustal PM has been shown to be transported over very long distances. Satellite data and other studies have shown that dust has been transported into the U.S. as a result of Asian or African dust storms.

Emission estimates of mechanically suspended crustal PM from sources within the U.S. are often quite high. However, this PM is often released very close to the ground, and with the exception of windblown dust events, thermal or turbulent forces sufficient to lift and transport them very far from their source are not usually present. Thus, as shown in table 1, crustal material is only a minor part of  $\text{PM}_{2.5}$  annual average concentrations.

Primary carbonaceous particles are largely the result of incomplete combustion of fossil or biomass fuels. This incomplete combustion usually results in emissions of both black carbon and organic carbon particles. High molecular weight organic molecules (i.e., molecules with 25 or more carbon atoms) are either emitted as solid or liquid particles, or as gases that rapidly condense into particle form. These heavy organic molecules sometimes are referred to as volatile organic compounds, but because their characteristics are most like direct PM emissions, they will be considered to be primary emissions for the purposes of this regulation. Primary organic carbon

<sup>22</sup> USEPA, *National Air Quality and Emissions Trends Report: 2003 Special Studies Edition*, Report Number EPA-454/R-03-005, Research Triangle Park, NC, September 2003. USEPA, *National Air Pollutant Emissions Trends*, Report Number EPA-454/R-00-002, Research Triangle Park, NC, March 2000. See also: <http://www.epa.gov/ttn/chief/trends/>.

also can be formed by condensation of semi-volatile compounds on the surface of other particles.

The main combustion sources emitting carbonaceous PM<sub>2.5</sub> are mobile sources (both onroad and nonroad), managed burning, wildland fires, open burning of waste, residential wood combustion, certain industrial processes, and coal and oil-burning boilers (utility, commercial and industrial). Certain organic particles also come from natural sources such as decomposition or crushing of plant detritus. Most combustion processes emit more organic particles than black carbon particles. A notable exception to this are diesel engines, which typically emit more black carbon particles than organic carbon. Because photochemistry is typically reduced in the cooler winter months for much of the country, studies indicate that the carbon fraction of PM mass in the winter months is likely dominated by direct PM emissions as opposed to secondarily formed organic aerosol.

Particles from the earth's crust may contain a combination of metallic oxides and biogenic derived organic matter. The combustion of surface debris will likely entrain some soil. Additionally, emissions from many processes and from the combustion of fossil fuels contain elements that are chemically similar to soil. Thus, a portion of the emissions from combustion activities may be classified as crustal in a compositional analysis of ambient PM<sub>2.5</sub>.

Secondary PM. Although some sulfate and nitrate salts (*i.e.* calcium sulfate, calcium nitrate) and acids (*i.e.* sulfuric acid, nitric acid) are directly emitted by sources under certain circumstances, sulfates and nitrates are predominately formed as a result of chemical reactions with ammonia and other compounds in the atmosphere. (See next sections for more detail.) During combustion, very small combustion nucleation particles (ultrafine particles, less than 0.1 $\mu$ m) are produced. These small particles act as nucleation sites where gases, water vapor, and other nucleation particles can condense or coagulate and therefore cause particle growth in both particle size and particle mass. Ammonium sulfate, ammonium nitrate, and secondarily formed organic aerosols, as well as agglomerating fine particles, all may use these ultrafine particles in their formation and growth in the atmosphere. The secondary organic aerosol (SOA) component of PM<sub>2.5</sub> is a complex mixture of perhaps thousands of organic compounds. A brief discussion of the sources of SO<sub>2</sub>, NO<sub>x</sub>, NH<sub>3</sub>, and organic gases (including VOC

and semi-volatile compounds), and the formation of sulfate, nitrate and secondary organic aerosol follows. More detailed discussions of the formation and characteristics of secondary particles can be found in the U.S. EPA Criteria Document,<sup>23</sup> and in the NARSTO Fine Particle Assessment,<sup>24</sup> on which much of the following discussion is based.

Sulfate. SO<sub>2</sub> is emitted mostly from the combustion of fossil fuels in boilers operated by electric utilities and other industry. Less than 20 percent of SO<sub>2</sub> emissions nationwide are from other sources, mainly from other industrial processes including oil refining and pulp and paper production.

The formation of sulfuric acid from the oxidation of SO<sub>2</sub> is an important process for most areas in North America. There are three different pathways for this transformation. First, gaseous SO<sub>2</sub> can be oxidized by the hydroxyl radical (OH) to create sulfuric acid. This gaseous SO<sub>2</sub> oxidation reaction occurs slowly and only in the daytime. The hydroxyl radical is an important product of the atmospheric chemistry process that forms ozone through the oxidation of NO<sub>x</sub> to form nitric acid. It is also involved in the formation of secondary organics.

Second, SO<sub>2</sub> can dissolve in cloud water (or fog or rain water), and there it can be oxidized to sulfuric acid by a variety of oxidants, or through catalysis by transition metals such as manganese or iron. If ammonia is present and taken up by the water droplet, then ammonium sulfate will form as a precipitant in the water droplet. After the cloud changes and the droplet evaporates, the sulfuric acid or ammonium sulfate remains in the atmosphere as a particle. This aqueous-phase production process involving oxidants can be very fast; in some cases all the available SO<sub>2</sub> can be oxidized in less than an hour.

<sup>23</sup> USEPA, 2003. Air Quality Criteria for Particulate Matter (Fourth External Review Draft). EPA/600/P-99/002aD and bD. U.S. Environmental Protection Agency, Office of Research and Development, National Center For Environmental Assessment, Research Triangle Park Office, Research Triangle Park, NC. June 2003. Available electronically at <http://cfpub.epa.gov/ncea/cfm/partmatt.cfm>.

<sup>24</sup> North American Research Strategy for Tropospheric Ozone and Particulate Matter (NARSTO) (2004) Particulate Matter Assessment for Policy Makers: A NARSTO Assessment. P. McMurry, M. Shepherd, and J. Vickery, eds. Cambridge University Press, Cambridge, England. ISBN 0 52 184287 5. For more information, see <http://www.cgenv.com/NARSTO>. See also supporting technical information for the Clear Skies Act, <http://www.epa.gov/clearskies/>, and for the Clean Air Interstate Rule, <http://www.epa.gov/cleanairinterstaterule>.

Third, SO<sub>2</sub> can be oxidized in reactions in the particle-bound water in the aerosol particles themselves. This process takes place continuously, but only produces appreciable sulfate in alkaline (dust, sea-salt) coarse particles.<sup>25</sup> Oxidation of SO<sub>2</sub> has been also observed on the surfaces of black carbon and metal oxide particles. During the last twenty years, much progress has been made in understanding the first two major pathways, but some important questions still remain about the smaller third pathway. Models indicate that more than half of the sulfuric acid in the eastern United States and in the overall atmosphere is produced in clouds.<sup>26</sup>

The sulfuric acid formed from the above pathways reacts readily with ammonia to form ammonium sulfate, (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>. If there is not enough ammonia present to fully neutralize the produced sulfuric acid (one molecule of sulfuric acid requires two molecules of ammonia), part of it exists as ammonium bisulfate, NH<sub>4</sub>HSO<sub>4</sub> (one molecule of sulfuric acid and one molecule of ammonia) and the particles are more acidic than ammonium sulfate. In extreme cases (in the absence of sufficient ammonia for neutralization), sulfate can exist in particles as sulfuric acid, H<sub>2</sub>SO<sub>4</sub>. Sulfuric acid often exists in the plumes of stacks where SO<sub>2</sub>, SO<sub>3</sub>, and water vapor are in much higher concentrations than in the ambient atmosphere, but these concentrations become quite small as the plume is cooled and diluted by mixing.

Nitrate. The main sources of NO<sub>x</sub> are combustion of fossil fuel in boilers and onroad mobile sources. Together they account for more than 60 percent of NO<sub>x</sub> emissions in PM<sub>2.5</sub> nonattainment areas (based on 2001 emission inventory information), with stationary and mobile source fuel combustion each accounting for about half of these emissions. Nitrates are formed from the oxidation of oxides of nitrogen into nitric acid either during the daytime

<sup>25</sup> Sievering, H., Boatman, J., Gorman, E., Kim, Y., Anderson, L., Ennis, G., Luria, M., Pandis, S.N., 1992. Removal of sulfur from the marine boundary layer by ozone oxidation in sea-salt. *Nature* 360, 571-573.

<sup>26</sup> McHenry, J.N., Dennis, R.L., 1994. The relative importance of oxidation pathways and clouds to atmospheric ambient sulfate production as predicted by the Regional Acid Deposition Model. *Journal of Applied Meteorology* 33, 890-905. Also: Langner, J., Rodhe, H., 1991. A global three dimensional model for the tropospheric sulfur cycle. *Journal of Atmospheric Chemistry* 13, 225-263.

(reaction with OH) or during the night (reactions with ozone and water).<sup>27</sup>

Nitric acid continuously transfers between the gas and the condensed phases through condensation and evaporation processes in the atmosphere. However, unless it reacts with other species (such as ammonia, sea salt, or dust) to form a neutralized salt, it will volatilize and not be measured using standard PM<sub>2.5</sub> measurement techniques.<sup>28</sup> The formation of aerosol ammonium nitrate is favored by the availability of ammonia, low temperatures, and high relative humidity. Because ammonium nitrate is not stable in higher temperatures, nitrate levels are typically lower in the summer months and higher in the winter months. The resulting ammonium nitrate is usually in the sub-micrometer particle size range. Reactions with sea-salt and dust lead to the formation of nitrates in coarse particles. Nitric acid may be dissolved in ambient aerosol particles.

Secondary Organic Aerosol (SOA). The organic component of ambient particles is a complex mixture of hundreds or even thousands of organic compounds. These organic compounds are either emitted directly from sources (*i.e.* primary organic aerosol) or can be formed by reactions in the ambient air (*i.e.* secondary organic aerosol, or SOA).

Volatile organic compounds<sup>29</sup> are key precursors in both the SOA and ozone formation processes. The lightest organic molecules (*i.e.*, molecules with six or fewer carbon atoms) occur in the atmosphere mainly as vapors and typically do not directly form organic particles at ambient temperatures due to

the high vapor pressure of their products. However, they participate in atmospheric chemistry processes resulting in the formation of ozone and certain free radical compounds (such as the hydroxyl radical [OH]) which in turn participate in the oxidation of semivolatile organic compounds to form secondary organic aerosols, sulfates and nitrates. These VOCs include all alkanes with up to six carbon atoms (from methane to hexane isomers), all alkenes with up to six carbon atoms (from ethene to hexene isomers), benzene and many low-molecular weight carbonyls, chlorinated compounds, and oxygenated solvents. The relative importance of organic compounds in the formation of organic particles varies from area to area, depending upon local emissions sources, atmospheric chemistry, and season of the year. Intermediate weight organic molecules (*i.e.*, compounds with 7 to 24 carbon atoms) often exhibit a range of volatilities and can exist in both the gas and aerosol phase. For this reason they are also referred to as semivolatile compounds. Semivolatile compounds react in the atmosphere to form secondary organic aerosols. These chemical reactions are accelerated in warmer temperatures, and studies show that SOA typically comprises a higher percentage of carbonaceous PM in the summer as opposed to the winter.

The production of SOA from the atmospheric oxidation of a specific VOC depends on four factors: Its atmospheric abundance, its chemical reactivity, the availability of oxidants (O<sub>3</sub>, OH, HNO<sub>3</sub>), and the volatility of its products. In addition, recent work by Jang and others

suggests that the presence of acidic aerosols may lead to an increased rate of SOA formation.<sup>30</sup>

Aromatic compounds such as toluene, xylene, and trimethyl benzene are considered to be the most significant anthropogenic SOA precursors and have been estimated to be responsible for 50 to 70 percent of total SOA in some airsheds.<sup>31</sup> As organic gases such as aromatics are oxidized in the gas phase by species such as the hydroxyl radical (OH), ozone (O<sub>3</sub>), and the nitrate radical (NO<sub>3</sub>) their oxidation products accumulate. Some of these products have low volatility and condense on available particles in an effort to establish equilibrium between the gas and condensed phases. Man-made sources of aromatics gases are mobile sources, petrochemical manufacturing and solvents. The experimental work of Odum and others<sup>32</sup> showed that the secondary organic aerosol formation potential of gasoline could be accounted for solely in terms of its aromatic fraction.

Some of the biogenic hydrocarbons emitted by trees are also considered to be important precursors of secondary organic particulate matter. Terpenes ( $\alpha$ - and  $\beta$ -pinene, limonene, carene, etc.) and the sesquiterpenes are expected to be major contributors to SOA in areas with significant vegetation cover, but isoprene is not. Terpenes are very prevalent in forested areas, especially in the southeastern U.S. The rest of the anthropogenic hydrocarbons (higher alkanes, paraffins, etc.) have been estimated to contribute 5–20 percent to the SOA concentration depending on the area.

TABLE 4.—ROLE OF ORGANIC GASES IN SECONDARY ORGANIC AEROSOL FORMATION

	SOA-forming organic gases	Non SOA-forming organic gases
Anthropogenic .....	—Aromatics (esp. toluene, xylenes, trimethyl-benzenes) —Higher alkanes (>6 C atoms) .....	—Lower alkanes <6 C atoms, (ethane to hexane isomers). —Benzene. —Lower MW carbonyls, chlorinated compounds & oxygenated solvents.
Biogenic .....	—Terpenes (esp. $\alpha$ - and $\beta$ -pinene, limonene, carene) .. —Sesquiterpenes .....	—Isoprene.

The contribution of the primary and secondary components of organic aerosol to the measured organic aerosol

<sup>27</sup> Wayne, R.P., *et al.*, 1991. The nitrate radical: physics, chemistry and the atmosphere. Atmospheric Environment 25A, 1–203.

<sup>28</sup> Seinfeld, J.H., Pandis, S.N., 1998. Atmospheric Chemistry and Physics: From Air Pollution to Climate Change. J. Wiley, New York.

<sup>29</sup> As discussed earlier, high molecular weight organic molecules (*i.e.*, molecules with 25 or more carbon atoms) are either emitted directly as

concentrations remains a controversial issue. Most of the research performed to date has been done in southern

particles or as liquids that rapidly condense onto existing particles. Because these condensable emissions act primarily as direct PM emissions, they are to be regulated as direct PM<sub>2.5</sub> emissions, not as VOC precursors, for the purposes of this regulation.

<sup>30</sup> Jang, M.; Czoschke, N.; Lee, S.; Kamens, R. Heterogenous Atmospheric Aerosol Production by Acid-Catalyzed Particle-Phase Reactions, *Science*, vol. 298, p. 814–817, October 25, 2002.

California, and more recently in central California, while fewer studies have been completed on other parts of North

<sup>31</sup> Grosjean, D., Seinfeld, J.H., 1989. Parameterization of the formation potential of secondary organic aerosols. Atmospheric Environment 23, 1733–1747.

<sup>32</sup> Odum, J.R., Jungkamp, T.P.W., Griffin, R.J., Flagan, R.C., Seinfeld, J.H., 1997. The atmospheric aerosol-forming potential of whole gasoline vapor. *Science* 276, 97–99.

America. Early studies suggested that the majority of the observed organic particulate matter was secondary in nature. Later investigators focusing on the emissions of primary organic material proposed that 80 percent or so of the organic aerosol in Southern California on a monthly basis resulted from direct organic particle emissions.<sup>33</sup> More recent studies suggest that the primary and secondary contributions are highly variable even during the same day. Studies of pollution episodes indicated that the contribution of SOA to the organic particulate matter varied from 20 percent to 80 percent during the same day.<sup>34</sup>

Despite significant progress that has been made in understanding the origins and properties of SOA, it remains the least understood component of PM<sub>2.5</sub>. The reactions forming secondary organics are complex and the number of intermediate and final compounds formed is voluminous. Some of the best efforts to unravel the chemical composition of ambient organic aerosol matter have been able to quantify the concentrations of hundreds of organic compounds representing only 10–20 percent of the total organic aerosol mass. For this reason, SOA continues to be a significant topic of research and investigation.

#### C. The Role of Ammonia in Sulfate, Nitrate & Secondary Organic Aerosol Formation

Ammonia (NH<sub>3</sub>) is a gaseous pollutant that is emitted by natural and anthropogenic sources. Emissions inventories for ammonia are considered to be among the most uncertain of any species related to PM. One recent estimate shows, however, that livestock (73 percent) and fertilizer application (17 percent) are the two primary sources of emissions.<sup>35</sup> (Note that these estimates do not include natural emissions from soil, which can be significant.)

Ammonia serves an important role in neutralizing acids in clouds, precipitation and particles. In particular, ammonia neutralizes sulfuric acid and nitric acid, the two key

contributors to acid deposition (acid rain). Deposited ammonia also can be an important nutrient, contributing to problems of eutrophication in water bodies.<sup>36</sup> Ammonia would not exist in particles, if not for the presence of acidic species with which it can combine to form a particle. In the eastern U.S., sulfate, nitrate, and the ammonium associated with them can together account for between roughly 30 percent and 75 percent of the PM<sub>2.5</sub> mass. The ammonium itself roughly accounts for between 5 percent and 20 percent of the PM<sub>2.5</sub>.<sup>37</sup>

The NARSTO Fine Particle Assessment indicates that sulfates form preferentially over nitrates and that particle nitrate formation is affected by a number of factors, including the availability of sulfates, NO<sub>x</sub>, ammonia, nitric acid and VOCs. The report also notes that implementing decreasing ammonia emissions where sulfate concentrations are high can reduce PM<sub>2.5</sub> mass concentrations, but may also increase particle and precipitation acidity.<sup>38</sup> As noted above, this acidification of particles may result in an increase in the formation of secondary organic compounds. Moreover, the relationship between ammonia and sulfate-nitrate equilibrium may also impact SOA formation, although this link is not well understood. Recent studies of ammonia sources and possible emission reduction measures indicate that ammonia controls are a maturing science, but that ongoing research will greatly improve our understanding of such control measures.

The same can be said of our understanding of the role of ammonia in aerosol formation. Based on the above information and further insights gained from the NARSTO Fine Particle Assessment, it is apparent that the formation of sulfate, nitrate and SOA compounds is a complex, nonlinear process. The control techniques for ammonia and the analytical tools to quantify the impact of reducing ammonia emissions on atmospheric aerosol formation are both evolving sciences. Also, there are indications that there may be considerable ambiguity concerning the results of reducing ammonia emissions and in some cases, there may be undesired consequences of ammonia reductions. Therefore, based

on our current understanding of ammonia's role in these complex precursor interactions and emission reduction processes, it seems prudent to continue research on ammonia control technologies and the ammonia—sulfate—nitrate—SOA equilibrium before one undertakes broad national programs to reduce ammonia emissions. However, as States and EPA develop a greater understanding over the coming years about the potential air quality effects of reducing ammonia emissions in specific nonattainment areas, it may be appropriate for ammonia reduction strategies to be included in future SIPs. At this time, however, we believe that reducing SO<sub>2</sub> and NO<sub>x</sub> will allow us to move with greater certainty toward achieving our nation's air quality goals. We encourage you to provide comments on the resolution of this issue.

#### D. Regional Patterns of Carbon, Sulfate and Nitrate, and Indications of Transport

Table 2 above shows that much of the eastern U.S., both urban and non-urban areas alike, is subject to high PM<sub>2.5</sub> concentrations, with the highest concentrations occurring in urban areas. Table 3 above compares the urban and rural concentrations of sulfate, nitrate, and carbon particles. The data show that there are high concentrations of sulfate across the region and that sulfate at urban monitoring sites is only slightly higher than at nearby non-urban sites. In contrast, the carbon mass at urban sites is significantly higher than at the nearby non-urban sites. This seems to indicate that sulfate is present on a much more regional scale and likely is associated with significant pollutant transport. On the other hand, a sizeable fraction of the carbonaceous mass seems to be more associated with urban sources. Mobile sources are much more concentrated in urban areas and may explain much of the elevated urban carbon concentrations. However, black carbon and organic aerosols still make up a large percentage of the non-urban air quality composition, indicating that there is a regional background level of carbon that is enhanced in urban areas by local sources.

The atmospheric lifetimes of particles and thus the distances they can be transported vary with particle size. The regional nature of PM<sub>2.5</sub> reflects the fact that fine particles can be transported over long distances. Ultra-fine and fine particles rapidly grow in size into a relatively stable size range, generally less than 2 μm. These fine particles are kept suspended by normal air motions and have very low deposition rates to surfaces. They can be transported

<sup>33</sup> Hildemann, L.M., Cass, G.R., Mazurek, M.A., Simoneit, B.R.T., 1993. Mathematical modeling of urban organic aerosol properties measured by high resolution gas-chromatography. *Environmental Science and Technology* 27, 2045–2055.

<sup>34</sup> Turpin, B.J., Lim, H.J., 2000. Species contributions to PM mass concentrations: Revisiting common assumptions for estimating organic mass, *Aerosol Science and Technology*, vol. 35, no. 1, p. 602–610.

<sup>35</sup> Anderson, N., R. Strader, and C. Davidson (2003) Airborne reduced nitrogen: Ammonia emissions from agriculture and other sources, *Environment International*, 29: 277–286.

<sup>36</sup> Seinfeld, J.H., Pandis, S.N., 1998. *Atmospheric Chemistry and Physics: From Air Pollution to Climate Change*. J. Wiley, New York.

<sup>37</sup> NARSTO, 2003. Particulate Matter Science for Policy Makers—A NARSTO Assessment, Parts 1 and 2. NARSTO Management Office (Envair), Pasco, Washington. <http://www.cgenv.com/NARSTO>.

<sup>38</sup> *Ibid.*, at S–31 (table S.4).

thousands of kilometers and remain in the atmosphere for a number of days. Thus, they are important when considering regional PM transport. Coarse particles can settle rapidly from the atmosphere within hours and normally travel only short distances. However, when mixed high into the atmosphere, as in some dust storms, the smaller-sized coarse-mode particles may have longer lives and travel greater distances.

Meteorology also plays a role in the size and characteristics of particles. High temperatures increase reaction rates, which may explain why sulfate concentrations are generally greatest in the summer. Conversely, lower temperatures result in a greater fraction of nitrates being in the particle phase. Fine particles, especially particles with a hygroscopic component, grow as the relative humidity increases, serve as cloud condensation nuclei, and grow into cloud droplets. If the cloud droplets grow large enough to form rain, the particles are removed in the rain. Falling rain drops impact coarse particles and remove them. Very fine particles are small enough to diffuse to the falling drop, be captured, and be removed in rain. However, falling rain drops are not nearly as effective in removing PM<sub>2.5</sub> as the cloud processes mentioned above. Sulfuric acid, ammonium nitrate, ammonium sulfates, and organic particles also are deposited on surfaces by dry deposition. Therefore, reductions in SO<sub>2</sub> and NO<sub>x</sub> emissions will decrease both acidic deposition and PM concentrations.

#### *E. Policy for Addressing PM<sub>2.5</sub> Precursors*

##### 1. Legal Authority To Regulate Precursors

The Clean Air Act authorizes the Agency to regulate criteria pollutant precursors. The term ‘air pollutant’ is defined in section 302(g) to include “any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term ‘air pollutant’ is used.” The first clause of this second sentence in section 302(g) explicitly authorizes the Administrator to identify and regulate precursors as air pollutants under other parts of the Act. In addition, the second clause of the sentence indicates that the Administrator has discretion to identify which pollutants should be classified as precursors for particular regulatory purposes. Thus, we do not necessarily construe the Act to require that EPA identify a particular precursor as an air

pollutant for all regulatory purposes where it can be demonstrated that various Clean Air Act programs address different aspects of the air pollutant problem. Likewise, we do not interpret the Act to require that EPA treat all precursors of a particular pollutant the same under any one program when there is a basis to distinguish between such precursors. For example, in a recent rule addressing PM<sub>2.5</sub> precursors for purposes of transportation conformity, we chose to adopt different approaches for some precursors based on the degree to which the various precursors emitted by transportation-related sources contributed to the PM<sub>2.5</sub> air quality problem. 70 FR 24280 (May 6, 2005).

Other provisions of the Act reinforce our reading of section 302(g) that Congress intended precursors to NAAQS pollutants to be subject to the air quality planning and control requirements of the Act, but also recognized that there may be circumstances where it is not appropriate to subject precursors to certain requirements of the Act. Section 182 of the Act provides for the regulation of NO<sub>x</sub> and VOCs as precursors to ozone in ozone nonattainment areas, but also provides in Section 182(f) that major stationary sources of NO<sub>x</sub> (an ozone precursor) are not subject to emission reductions controls for ozone where the State shows through modeling that NO<sub>x</sub> reductions do not decrease ozone. Section 189(e) provides for the regulation of PM<sub>10</sub> precursors in PM<sub>10</sub> nonattainment areas, but also recognizes that there may be certain circumstances where it is not appropriate to apply control requirements to PM<sub>10</sub> precursors. In providing that the Agency was to issue guidelines for the control of PM<sub>10</sub> precursors, the legislative history of Section 189(e) recognized the complexity behind the science of precursor transformation into PM<sub>10</sub> ambient concentrations and the need to harmonize the regulation of PM<sub>10</sub> precursors with other provisions of the Act:

The Committee notes that some of these precursors may well be controlled under other provisions of the Act. The Committee intends that \* \* \* the Administrator will develop models, mechanisms, and other methodology to assess the significance of the PM<sub>10</sub> precursors in improving air quality and reducing PM<sub>10</sub>. Additionally, the Administrator should consider the impact on ozone levels of PM<sub>10</sub> precursor controls. The Committee expects the Administrator to harmonize the PM<sub>10</sub> reduction objective of this section with other applicable regulations of this Act regarding PM<sub>10</sub> precursors, such as NO<sub>x</sub>.

See H. Rpt. 101–490, Pt. 1, at 268 (May 17, 1990), reprinted in S. Prt. 103–38, Vol. II, at 3292.

In summary, section 302(g) of the Act clearly calls for the regulation of precursor pollutants, but the Act also identifies circumstances when it may not be appropriate to regulate precursors and gives the Administrator discretion to determine how to address particular precursors under various programs required by the Clean Air Act. Due to the complexities associated with precursor emissions and their variability from location to location, we believe that in certain situations it may not be effective or appropriate to control a certain precursor under a particular regulatory program or for EPA to require similar control of a particular precursor in all areas of the country.

In the following section II.E.2, we discuss our proposal for how States should address PM<sub>2.5</sub> precursors for the majority of the nonattainment program issues in PM<sub>2.5</sub> implementation plans, such as RACT, RACM, reasonable further progress and most of the other issues discussed in section III. This discussion is linked to related discussions of precursor issues in the NSR section of this package (see section III.M.), the transportation conformity program (see section III.K. of this package, and the conformity regulations<sup>39</sup>), and the general conformity program (see section III.L. of this package. All of these programs take effect prior to approval of SIPs for attaining the PM<sub>2.5</sub> NAAQS. In the case of NSR, the program applies on the effective date of the nonattainment area designation. In the case of transportation conformity and general conformity, the program takes effect one year from the effective date of designation of the nonattainment area (i.e., April 5, 2006). Thus, for each of these programs there is an interim period between the date the program becomes applicable to a given nonattainment area and the date the State receives EPA approval of its overall PM<sub>2.5</sub> implementation plan. Options for addressing PM<sub>2.5</sub> precursors in the NSR program are discussed in section III.M. below. For the transportation conformity program, precursor policies are addressed in the final rule on PM<sub>2.5</sub> precursors.<sup>40</sup>

<sup>39</sup> See the final transportation conformity rule (69 FR 40004; July 1, 2004); the conformity rule amendments addressing PM<sub>2.5</sub> precursors (70 FR 24280; May 6, 2005); and transportation conformity regulations at 40 CFR Parts 51 and 93.

<sup>40</sup> The final transportation conformity rule on PM<sub>2.5</sub> precursors was published in the **Federal Register** on May 6, 2005 at 70 FR 24280.



## 2. Proposed Policy Options for Addressing PM<sub>2.5</sub> Precursors in Nonattainment Plan Programs

This section discusses potential options for addressing the PM<sub>2.5</sub> precursors SO<sub>2</sub>, ammonia, NO<sub>x</sub> and volatile organic compounds in PM<sub>2.5</sub> nonattainment plan programs other than NSR and transportation conformity. Several other preamble sections in today's notice, including those on RFP, RACT, RACM, and modeling and attainment demonstrations refer the reader to this overall section. Our approach to precursors of PM<sub>2.5</sub> in these areas will be decided after consideration of comments through this rulemaking process and our policy for PM<sub>2.5</sub> precursors will be stated in the final rule.

As an initial matter, it is helpful to clarify the terminology we use throughout this notice to discuss precursors. We recognize NO<sub>x</sub>, SO<sub>2</sub>, VOCs, and ammonia as precursors of PM<sub>2.5</sub> in the scientific sense because these pollutants can contribute to the formation of PM<sub>2.5</sub> in the ambient air. However, the degree to which these individual precursors and pollutants contribute to PM<sub>2.5</sub> formation in a given location is complex and variable. This requires that we further consider in this action how States should address these PM<sub>2.5</sub> precursors in their PM<sub>2.5</sub> nonattainment plan programs. Thus, where we believe that all states should address a given precursor of PM<sub>2.5</sub> under a specific PM<sub>2.5</sub> nonattainment plan requirement, we refer to it more specifically as a "PM<sub>2.5</sub> nonattainment plan precursor, transportation conformity precursor, or NSR precursor. We request comment on all aspects of the proposed options set forth below.

**Sulfur dioxide.** We believe the previous technical discussion and analysis of speciated air quality data provides an appropriate basis for requiring States to address sulfur dioxide as a PM<sub>2.5</sub> nonattainment plan precursor in all areas.<sup>41</sup> The fact that sulfate is a significant contributor (e.g. ranging from 9 percent to 40 percent) to PM<sub>2.5</sub> nonattainment and other air quality problems in all regions of the country is a critical piece of evidence supporting this approach. The EPA requests comments on the requirement

that SO<sub>2</sub> is a PM<sub>2.5</sub> nonattainment plan precursor in all nonattainment areas.

Ammonia. In regard to ammonia, however, we believe there is sufficient uncertainty about emissions inventories and about the potential efficacy of control measures from location to location such that the most appropriate approach for proposal is a case-by-case approach. Ammonia reductions may be appropriate in selected locations, but in others such reductions may lead to increased atmospheric acidity, exacerbating acidic deposition problems. Each State should evaluate whether reducing ammonia emissions would lead to PM<sub>2.5</sub> reductions in their specific PM<sub>2.5</sub> nonattainment areas. Under this proposed policy, however, States are not required to address ammonia as a PM<sub>2.5</sub> nonattainment plan precursor, unless the State or EPA makes a technical demonstration that ammonia emissions from sources in the State significantly contribute to the PM<sub>2.5</sub> problem in a given nonattainment area or to other downwind air quality concerns. As noted above, ammonia reductions may be effective primarily in areas where nitric acid is in abundance and ammonia is the limiting factor to ammonium nitrate formation. Where the State or EPA has determined that ammonia is a significant contributor to PM<sub>2.5</sub> formation in a nonattainment area, the State would address ammonia emissions in its nonattainment SIP due in 2008. From that point in time, the implementation of the PM program and other associated programs (e.g. the NSR program and transportation conformity program) in that area would proceed in accordance with this determination.<sup>42</sup> Ammonia will be addressed under the transportation conformity program if the SIP establishes a budget specifically for on-road ammonia emissions. The EPA requests comments on this approach to addressing ammonia emissions under the PM<sub>2.5</sub> program.

**Nitrogen oxides.** Based on a review of speciated monitoring data analyses, it is apparent that nitrate concentrations vary significantly across the country. For example, in some southeastern locations, annual average nitrate levels are in the range of 6 to 8 percent of total PM<sub>2.5</sub> mass, whereas nitrate comprises 40 percent or more of PM<sub>2.5</sub> mass in certain California locations. Nitrate

formation is favored by the availability of ammonia, low temperatures, and high relative humidity. It is also dependent upon the relative degree of nearby SO<sub>2</sub> emissions because ammonia reacts preferentially with SO<sub>2</sub> over NO<sub>x</sub>.

The sources of NO<sub>x</sub> are numerous and widespread, including motor vehicles, power plants, and many other combustion activities. We believe the previous technical discussion and analysis of speciated air quality data provides an appropriate basis for presuming that states must evaluate and implement reasonable controls on sources of NO<sub>x</sub> in all nonattainment areas. Under this policy, States are required to address NO<sub>x</sub> under all aspects of the program, unless the State and EPA makes a finding that NO<sub>x</sub> emissions from sources in the State do not significantly contribute to the PM<sub>2.5</sub> problem in a given area or to other downwind air quality concerns. An additional consideration is that the majority of potential PM<sub>2.5</sub> nonattainment areas are already designated as nonattainment for the 8-hour ozone standard. For PM<sub>2.5</sub> areas that are also violating the 8-hour ozone standard, strategies to reduce NO<sub>x</sub> emissions will help address both air pollution problems. The EPA requests comments on this approach to addressing NO<sub>x</sub> emissions under the PM<sub>2.5</sub> program.

**Volatile Organic Compounds (VOC).** Section II.B. discusses the main categories of organic compounds with varying degrees of volatility: Highly reactive, volatile compounds with six or fewer carbon atoms which indirectly contribute to PM formation through the formation of oxidizing compounds such as the hydroxyl radical and ozone; and semivolatile compounds with between seven and 24 carbon atoms which can exist in particle form and can readily be oxidized to form other low volatility compounds. High molecular weight organic compounds (with 25 carbon atoms or more and low vapor pressure) are emitted directly as primary organic particles and exist primarily in the condensed phase at ambient temperatures. For this reason, these organic compounds will be regulated as primary PM<sub>2.5</sub> emissions and not VOCs for the purposes of the PM<sub>2.5</sub> implementation program.

Current scientific and technical information clearly shows that carbonaceous material is a significant fraction of total PM<sub>2.5</sub> mass in most areas, and that certain aromatic VOC emissions such as toluene, xylene, and trimethyl-benzene are precursors to the formation of secondary organic aerosol. Further, analyses of ambient data

<sup>41</sup> As stated in the May 6, 2005 (70 FR 24282) final transportation conformity rule on PM<sub>2.5</sub> precursors, on-road emissions of sulfur dioxide would only be addressed in conformity determinations if the state air agency or EPA Regional Administrator found that the on-road emissions are a significant contributor to the area's PM<sub>2.5</sub> problem or if the area's SIP established a motor vehicle emissions budget for sulfur oxides.

<sup>42</sup> As stated in the May 6, 2005 (70 FR 24282) final transportation conformity rule on PM<sub>2.5</sub> precursors, on-road emissions of ammonia would also be addressed in conformity determinations before a SIP is submitted and budgets are found adequate or approved if the state air agency or EPA Regional Administrator found that the on-road emissions of ammonia are a significant contributor to the area's PM<sub>2.5</sub> problem.

indicate that a considerable fraction of the total carbonaceous material is likely from local as opposed to regional sources.

However, while significant progress has been made in understanding the role of gaseous organic material in the formation of organic PM, this relationship remains complex. We recognize that further research and technical tools are needed to better characterize emissions inventories for specific VOC compounds, and to determine the extent of the contribution of specific VOC compounds to organic PM mass.

In light of the factors discussed above, EPA proposes that States are not required to address VOC's as PM<sub>2.5</sub> nonattainment plan precursors, unless the state or EPA makes a finding that VOC's significantly contribute to a PM<sub>2.5</sub> nonattainment problem in the State or to other downwind air quality concerns. In proposing this policy, we are mindful of the fact that a majority of areas that have been designated as nonattainment for PM<sub>2.5</sub> are already designated as nonattainment for the 8-hour ozone standard. Thus, these areas will already be required to evaluate VOC control measures for ozone purposes. (The inventory of VOC as defined here, including gaseous organic compounds, is essentially identical to the inventory of VOC for ozone control purposes.) The few PM<sub>2.5</sub> areas not designated as nonattainment for the 8-hour ozone standard will not be required to regulate VOC emissions sources unless the State or EPA makes a relevant technical finding. We request comments accompanied by detailed technical supporting information on this proposed policy approach for addressing VOC's under the PM<sub>2.5</sub> implementation program.

In general, Any State or EPA technical demonstration to modify the presumptive policy approach for ammonia, NO<sub>x</sub>, or VOC should be developed well in advance of the SIP submittal date. In addition, the development of such a technical demonstration should include consultation with appropriate State, local, and EPA technical representatives representing air quality and transportation agencies.

### III. What Are the Specific Elements of EPA's PM<sub>2.5</sub> Implementation Program?

*A. What classification options are under consideration for PM<sub>2.5</sub> nonattainment areas?*

#### 1. Background

Section 172 of subpart 1 contains the general requirements for SIPs for all

nonattainment areas. Section 172(a)(1) states that on or after the date of designation, the Administrator may classify the area for the purpose of applying an attainment date or for some other purpose. Thus, a classification system is allowed under section 172, but is not required for the purposes of implementing a national ambient air quality standard.

If we choose to establish a classification system, the Act states that we may consider certain factors in doing so, such as the severity of nonattainment in such areas, and the availability and feasibility of the pollution control measures that may be needed to achieve attainment. We must publish a notice in the **Federal Register** announcing any classifications and provide for at least 30 days for written comment. Classifications are not subject to notice and comment rulemaking requirements, however, nor are they subject to judicial review until we take any action on plan submissions (under sections 110(k) or 110(l)), or sanctions in cases where the State fails to submit a plan (under section 179).

#### 2. Proposed Options for PM<sub>2.5</sub> Classifications

This section describes two implementation approaches for classifying or not classifying PM<sub>2.5</sub> nonattainment areas. The first and preferred option is to not have any classification system. The second option would have a two-tiered classification system, with areas classified as "moderate" or "serious" based on specific criteria. These options are discussed below.

##### a. No Classification System Based on Design Values

In today's notice, our preferred option is to not have any system for classifying PM<sub>2.5</sub> nonattainment areas or assigning attainment dates and control strategy requirements based on the severity of the nonattainment problem (e.g. the area's design value). We believe that an advantage of this approach is that it will provide a relatively simple implementation structure for state implementation of the PM<sub>2.5</sub> standards. This approach also will allow flexibility to determine attainment dates and control strategies appropriate for each area under Clean Air Act requirements.

We believe that with the variable mix of sources contributing to PM<sub>2.5</sub> concentrations in various regions of the country and the variable set of appropriate control measures, it may not be advantageous to have a classification system which automatically requires a longer list of control strategies, and

allows a later attainment date, for areas with higher current levels of PM<sub>2.5</sub> pollution.

Under our proposed approach, the State will be required to submit an attainment demonstration for each nonattainment area proposing an attainment date that is as expeditious as practicable for each area. (Attainment date issues are discussed in more detail in section III.C.) In determining what attainment date is considered "as expeditious as practicable," the State will need to demonstrate that it is achieving RFP (see section III.G.), and it will have to adopt rules to implement the RACT and RACM requirements within the nonattainment area (see section III.I.) in order to attain the standard as expeditiously as practicable. In determining an expeditious attainment date, the State will need to take into consideration the air quality improvements that are expected due to other emission reduction programs at the national level (e.g. Tier II vehicle standards, heavy-duty diesel program, etc.), regional level reductions (e.g. NO<sub>x</sub> SIP call), any additional regional SO<sub>2</sub> or NO<sub>x</sub> reductions that may be achieved under a legislative or regulatory approach, and State level (e.g. Clean Smokestacks legislation in North Carolina).

##### b. Two-Tiered Classification System

Another option on which we are seeking comment is a two-tiered classification system. Under this approach, areas with higher PM<sub>2.5</sub> levels (i.e. design values) would qualify for an attainment date extension beyond April 2010 to no later than April 2015. In return, consistent with the approach in subpart 2, part D of Title I for ozone, such areas would be required to include certain mandatory measures in their SIPs.

Definition of serious and moderate areas. This option would establish two nonattainment classification categories: "moderate" and "serious." These categories could be based on the severity of nonattainment (e.g., serious areas would be those with a design value above a specific threshold), the attainment date for the area (e.g., serious areas would be those with attainment dates after April 2010), or some other measure. We invite comment on appropriate ways to define moderate and serious areas and request that any recommended approach be accompanied by adequate supporting information.

Under a potential two-tiered classification system, all areas not classified as "serious" would be classified as "moderate." However, any

moderate area that needed an attainment date longer than five years would be reclassified to serious. This would ensure that areas with a more persistent PM<sub>2.5</sub> problem are subject to more stringent requirements, even if they are not one of the areas with the highest current design values. For such areas, the state would be required to request reclassification and ensure that the 2008 attainment SIP submission for the area includes all measures needed to meet serious area requirements.

**Serious area requirements.** Serious areas would be required to meet RACM and RACT requirements described elsewhere in this notice. The attainment date would be as expeditiously as practicable, but no later than 10 years after designation, depending on the year in which the area would be projected to attain considering existing control requirements and the effect of RACM, RACT and RFP.

Various approaches can be considered for outlining additional requirements for serious areas beyond those required for all areas by subpart 1. More stringent requirements for serious areas could be established for RFP, RACT, and/or RACM.

For RFP, one approach could involve setting a more prescriptive or higher RFP requirement for serious areas from the 2002 base year to the attainment year. For example, the required rate could be a specific annual percentage reduction in direct PM<sub>2.5</sub> and all PM<sub>2.5</sub> precursors, analogous to the 3% per year reduction requirement for the 1-hour ozone program in section 182 of the Act. This approach is described among the options in the RFP section of this proposal (see section III.G.5). Progress would be evaluated in 2008 and every 3 years thereafter. An alternative could be to require a specific weighted average annual reduction in direct PM<sub>2.5</sub> and all precursors, based upon the PM<sub>2.5</sub> speciation profile for the relevant urban area.

An additional requirement for serious areas could be to define a lower emissions threshold for major sources for purposes of determining applicability for RACT than would apply in moderate areas. Note that the option of a lower threshold for RACT is consistent with only options 1 and 3 proposed in the RACT section of this notice (see section III.I.5). A discussion of possible thresholds is included in that section.

**Moderate area requirements.** Under this option, "moderate" areas would constitute all areas that are not categorized as "serious." They would be required to submit 2008 plans that demonstrate attainment of the standards

as expeditiously as practicable, but not later than April 2010.<sup>43</sup> Attainment would be based on implementation of existing measures (e.g. CAIR, mobile source rules, previously adopted state and local measures) and any other measures necessary to meet the RACT, RACM, RFP, and expeditious attainment requirements. (The scope of these requirements will be determined based on which options for these program elements are adopted in the final rule.) The area would be required to provide a demonstration that it had adopted all reasonable controls to ensure expeditious attainment, and that there was no additional collection of reasonable controls (i.e. RACM and RACT) available in the area that would advance the attainment date by at least one year. EPA seeks comment on what would constitute adequate information provided by the State to show that a moderate area has met the RACT, RACM, and RFP requirements and cannot advance the attainment date.

**Failure to attain.** Under the general authority in section 172(a)(1) to establish a classification system, EPA proposes a process here that is similar to the PM<sub>10</sub> process included in subpart 4 for addressing areas that fail to attain. With this approach, EPA would have the authority to make a finding of failure to attain within 6 months for any moderate area that fails to attain the standards by April 2010. Once EPA issues such a finding, the area would be automatically "bumped-up" to the serious category. The area would then have one year to develop a revised implementation plan and RFP plan in order to attain the standards as expeditiously as practicable, but no later than April 2015.

Any serious area that fails to attain by its attainment date would be subject to the requirements of sections 179(c) and (d) of the Act. EPA would make a finding of failure to attain no later than 6 months after the attainment date and publish a notice in the **Federal Register**. The state would be required to submit an implementation plan revision within one year after publication of the **Federal Register** notice pursuant to section 179(d)(2) of the Act.

**Voluntary Bump-Up.** Under this option, any area wishing to reclassify from moderate to serious may do so. The Administrator shall publish a notice in the **Federal Register** of any such request and of the action by the Administrator granting the request.

### c. Rural Transport Classification

The 8-hour ozone implementation program includes a "rural transport classification" for subpart 1 nonattainment areas. In this section we discuss whether an area classification of this type would be appropriate for the PM<sub>2.5</sub> implementation program in light of the fact that no currently designated PM<sub>2.5</sub> nonattainment area could meet criteria similar to those that apply to rural transport areas under the ozone implementation program.

Under this potential concept, a PM<sub>2.5</sub> nonattainment area would qualify for the "rural transport" classification if it met criteria similar to those specified for rural transport areas for the 1-hour ozone standard under section 182(h). Section 182(h) defines "rural transport" areas as those areas that do not include, and are not adjacent to, any part of a Metropolitan Statistical Area (MSA) or, where one exists, a Consolidated Metropolitan Statistical Area (CMSA). Because OMB issued revised metropolitan area definitions in 2003, EPA suggests that if PM<sub>2.5</sub> rural transport areas are made possible under the final rule, this geographic criterion would be revised for PM<sub>2.5</sub> such that a rural transport area could not include or be adjacent to any part of a core-based statistical area (CBSA) or a consolidated statistical area (CSA). Section 182(h) further limits the category to those areas whose own emissions do not make a significant contribution to pollutant concentrations in those areas, or in other areas.

In the event the ozone approach is followed, a State with a PM<sub>2.5</sub> "rural transport" area would need to (1) demonstrate that the area meets the above criteria, (2) demonstrate using EPA approved attainment modeling that the nonattainment problem in the area is due to the "overwhelming transport" of emissions from outside the area, and (3) demonstrate that sources of PM<sub>2.5</sub> and its precursor emissions within the boundaries of the area do not contribute significantly to PM<sub>2.5</sub> concentrations that are measured in the area or in other areas. Because this is a proposed rule, EPA currently has not developed any modeling guidance for PM<sub>2.5</sub> rural transport demonstrations.

An area which qualifies for the "rural transport" classification would only be required to adopt local control measures sufficient to demonstrate that the area would attain the standard by its attainment date "but for" the overwhelming transport of emissions emanating from upwind States. RFP requirements under subpart 1 would

<sup>43</sup> Under this approach, attaining by April 2010 means that the design value for 2007–2009 would attain the standards.

still apply to these areas (see section E of this notice).

As with other nonattainment areas, rural transport nonattainment areas would be subject to NSR, transportation conformity, and general conformity requirements. However, in section M of today's notice, we are soliciting comment on whether it would be appropriate to establish less burdensome NSR requirements in the event that a classification for rural transport areas is adopted in the final rule.<sup>44</sup> Regarding transportation conformity, EPA has issued revised conformity regulations to address the 8-hour ozone and PM<sub>2.5</sub> standards in separate actions. In general under the current program, nonattainment areas not part of a metropolitan planning organization subject to transportation conformity already have less burdensome requirements. For example, areas without a metropolitan planning organization do not need to conduct emissions analyses for conformity purposes until the time that a federal highway or transit project is proposed within the area (see further discussion of transportation conformity issues in section III.K. of this notice).

Under this potential approach, a State applying for a rural transport classification for an area would need to develop an attainment demonstration that takes into consideration projected emissions reductions from the implementation of local, regional, and national control measures in order to show that it would reach attainment as expeditiously as practicable. Because such an area would need to rely on national or regional reductions to some degree, the State or Tribe should take into consideration the attainment date of contributing nonattainment areas that contribute to the affected area's air quality problem, and the implementation schedule for any regional reduction strategy (such as a regulation to address transported emissions of SO<sub>2</sub> and NO<sub>x</sub>), in developing its attainment demonstration. The issues related to interstate transport are also discussed elsewhere in this proposed rulemaking.

In reviewing the currently designated PM<sub>2.5</sub> nonattainment areas, it appears that all areas are within or adjacent to a CBSA or CSA, and thus would not meet the criteria discussed above.

<sup>44</sup> The Agency is also considering the development of a separate proposed rule on flexible implementation of nonattainment NSR for any areas where transport is the primary cause of the area's nonattainment for any criteria pollutant. Such a proposal would not be dependent on the incorporation of a transport classification in a classification system for a NAAQS.

Because of this fact, EPA requests comment on whether this type of classification option is needed at all under the PM<sub>2.5</sub> implementation program.

*B. When are PM<sub>2.5</sub> attainment demonstrations and SIPs due, and what requirements must they address?*

Part D of Title I of the Act sets forth the requirements for SIPs needed to attain the national ambient air quality standards. Part D includes a general subpart 1 which applies to all NAAQS for which a specific subpart does not exist. Because the PM standards were not established until 1997, the nonattainment plan provisions found in section 172 of subpart 1 apply.

Section 172(b) of the Act requires that at the time the Agency promulgates nonattainment area designations, the EPA must also establish a schedule for states to submit SIPs meeting the applicable requirements of section 172(c) and of section 110(a)(2) of the Act. Nonattainment area designations were finalized in December 2004, and a supplemental notice was issued in April 2005. Consistent with section 172(b) of the Act, section 51.1002 of the proposed rule requires the State to submit its attainment demonstration and SIP revision within three years, or by April 2008.

Section 51.1006 of the proposed rule addresses the situation in which an area is initially designated as attainment/unclassifiable but is later designated as nonattainment based on air quality data after the 2001–2003 period. Under such circumstances, the SIP submittal date would be three years from the effective date of the redesignation, and the attainment date would be as expeditiously as practicable but no later than five years from the effective date of the redesignation.

The section 172(c) requirements that States are to address under section 172(c) (including RACT, RACM, RFP, contingency measures, emission inventory requirements, and NSR) are discussed in later sections of this notice. Section 110(a)(2) of the Act requires all States to develop and maintain a solid air quality management infrastructure, including enforceable emission limitations, an ambient monitoring program, an enforcement program, air quality modeling, and adequate personnel, resources, and legal authority. Section 110(a)(2)(D) also requires State plans to prohibit emissions from within the State which contribute significantly to nonattainment or maintenance areas in any other State, or which interfere with programs under part C to prevent

significant deterioration of air quality or to achieve reasonable progress toward the national visibility goal for federal class I areas (national parks and wilderness areas). In order to assist States in addressing their obligations regarding regionally transported pollution, EPA has finalized the CAIR to reduce SO<sub>2</sub> and nitrogen oxide emissions from large electric generating units (see section I.E.2. for further discussion).<sup>45</sup>

To date, few states have submitted a SIP revision addressing the section 110(a) requirements for the purposes of implementing the PM standards. The EPA recognizes that this situation is due in part to the fact that there were a series of legal challenges to the PM standards which were not resolved until March 2002, at which time the standards and EPA's decision process were upheld (see section I.B. for further discussion of past legal challenges to the standards). To address the States' continuing obligation to address the requirements of section 110(a), however, section 51.1002 of the proposed rule also requires each State to address the required elements of section 110(a)(2) of the Act in its nonattainment plan SIP revision, if it has not already done so.

*C. What are the attainment dates for PM<sub>2.5</sub> nonattainment areas?*

1. Background

Section 172(a)(2)(A) states that the attainment date for a nonattainment area must be "as expeditiously as practicable, but no later than 5 years from the date of designation for the area." Since PM<sub>2.5</sub> designations were promulgated in December 2004 and have an effective date of April 2005, the initial attainment date for PM<sub>2.5</sub> areas would be no later than April 2010. For an area with an attainment date of April 2010, EPA would determine whether it had attained the standard by evaluating air quality data from the three previous calendar years (*i.e.* 2007, 2008, and 2009).

Section 172 also states that if EPA deems it appropriate, the Agency may extend the attainment date for an area for a period not greater than 10 years from the date of designation, taking into account the severity of the nonattainment problem in the area, and the availability and feasibility of pollution control measures. (See further discussion of attainment date extensions in section III.C.4.) For any areas that are granted the full five year attainment date extension, the attainment date would be no later than April 2015. For

<sup>45</sup> More information on the Clean Air Interstate Rule is available at: <http://www.epa.gov/cair>.

such areas, EPA would determine whether they have attained the standard by evaluating air quality data from 2012, 2013, and 2014. Section 51.1004 of the proposed regulations addresses the attainment date requirement.

## 2. Consideration of Existing Measures in Proposing an Attainment Date

As part of their attainment demonstrations, States will need to assess the effect of implementation of existing national and State programs already in place (e.g. partial implementation of the CAIR rule, final Acid Rain Program, motor vehicle tier II standards and heavy-duty diesel engine standards, NO<sub>x</sub> SIP call, State legislation such as Clean Smokestacks bill in North Carolina), plus the implementation of RACT and RACM in the nonattainment area, to determine what is the most expeditious attainment date for the area. States in this situation will need to first project the emissions reductions expected by 2009 due to national standards, State regulations, and any local measures already being implemented, and then conduct local-scale modeling to project the estimated level of air quality improvement in accordance with EPA's modeling guidance. These assessments and any needed State emission reduction programs will need to be part of the State's 2008 attainment demonstration.

## 3. Areas May Qualify for Two 1-Year Attainment Date Extensions

Subpart 1 provides for States to request 2 one-year extensions of the attainment date for a nonattainment area under limited circumstances. Section 172(a)(2)(C) of the Act provides that EPA initially may extend an area's attainment date for one year, provided that the State has complied with all the requirements and commitments pertaining to the area in the applicable implementation plan, and provided that the area has had no more than a minimal number of "exceedances" of the relevant standard in the preceding year. Because the PM<sub>2.5</sub> standards do not have exceedance-based forms but are based on 3-year averaging periods, we interpret the air quality test in section 51.1005 to mean that the area would need to have "clean data" for the third of the three years that are to be evaluated to determine attainment.<sup>46</sup> By this we mean that for the third year, the air quality for all monitors in the area as analyzed in accordance with Appendix N to 40 CFR Part 50 each must have an annual average of 15.0 µg/m<sup>3</sup> or less, and a 98th percentile of 24-

hour monitoring values of 65 µg/m<sup>3</sup> or less in order to qualify for a 1-year extension. (Given the rounding provisions specified in 40 CFR Part 50, Appendix N, these criteria would be satisfied if the concentrations before final rounding are less than an annual average of 15.05 µg/m<sup>3</sup> and a 24-hour value of 65.5 µg/m<sup>3</sup>.)

For example, suppose an area in violation of the annual standard has an attainment date of April 2010, and its annual average for 2007 was 15.8 and for 2008 was 15.6. If the annual average for the area in 2009 is 14.9, then the 3-year average would be 15.4, and it would not have attained the standard. We interpret section 172(a)(2)(C) as allowing the area to submit a request to EPA for a one-year extension of its attainment date to 2013 (provided the State has also complied with its requirements and commitments) since the 14.9 ambient air quality value in the third year (2009) met the test of being at or below 15.0. Section 51.1005(a) of the proposed regulation addresses the initial one-year attainment date extension.

The air quality measured in 2010 in conjunction with prior data will determine if the area attains the standard, qualifies for a second one-year extension, or does not attain the standard. For example, if the area's annual average for 2011 is 14.3, then its 3-year average for 2009–2011 would be 14.9 and it would have met the annual standard.

If the area's annual average for 2011 is 14.9, however, then its 3-year average for 2009–2011 would be 15.1. In this situation the area would not have attained the standard, but the area would meet the air quality test for the second of the 1-year extensions allowed under section 172(a)(2)(C), because the 2011 annual average was at or below 15.0. Section 51.1005(b) of the proposed rule addresses the second one-year attainment date extension. After obtaining a second one-year extension, the State would evaluate whether the air quality values in 2012, in conjunction with 2010 and 2011 data, bring the area into attainment.

Pursuant to section 172(a)(2)(C), States must submit additional information to EPA to demonstrate that they have complied with applicable requirements, commitments, and milestones in the implementation plan. This information is needed in order for EPA to make a decision on whether to grant a 1-year attainment date extension. The EPA will not be inclined to grant a 1-year attainment date extension to an area unless the State can demonstrate that it has met important requirements

contained in the area's implementation plan. States must demonstrate that: (1) Control measures have been submitted in the form of a SIP revision and substantially implemented to satisfy the requirements of RACT and RACM for the area, (2) the area has made emissions reductions progress that represents reasonable further progress (RFP) toward attainment of the NAAQS, and (3) trends related to recent air quality data for the area indicate that the area is in fact making progress toward attainment of the standard. Any decision made by EPA to extend the attainment date for an area will be based on facts specific to the nonattainment area at issue, and will only be made after providing notice in the **Federal Register** and an opportunity for the public to comment.

If an area fails to attain the standard by the attainment date, EPA would publish a finding to this effect in accordance with section 179 of the Act. The area then would be required, within 1 year of publication of this finding, to develop a revised SIP containing additional emission reduction measures needed to attain the standard as expeditiously as practicable. See section III.C.5. below for further discussion.

## 4. Areas May Submit a SIP Demonstrating That It Is Impracticable To Attain by the 5-Year Attainment Date

As stated previously, under section 172(a)(2)(A), EPA may grant an area an extension of the initial attainment date for a period of one to five years. States that request an extension of the attainment date under this provision of the Act must submit a SIP in 2008 that includes, among other things, an attainment demonstration showing that attainment within 5 years of the designation date is impracticable. It must also show that the area will attain the standard by an alternative date that is as expeditiously as practicable, but in no case later than 10 years after the designation date for the area (i.e. by April 2015 for an area with an effective designation date of April 2005). An appropriate extension in some cases may be only 1 or 2 years—a five-year extension is not automatic upon request.

The attainment demonstration must provide sufficient information to show that attainment by the initial attainment date is impracticable due the severity of the nonattainment problem in the area, the lack of available or feasible control measures, and any other pertinent information which shows that additional time is required for the area to attain the standard. States requesting an extension of the attainment date must also demonstrate that all local

<sup>46</sup> See section 51.1005 of the proposed regulation.

control measures that are reasonably available and technically feasible for the area are currently being implemented to bring about expeditious attainment of the standard by the alternative attainment date for the area. The State's plan will need to project the emissions reductions expected due to federally enforceable national standards, State regulations, and local measures such as RACT and RACM, and then conduct modeling to project the level of air quality improvement in accordance with EPA's modeling guidance. The EPA will not grant an extension of the attainment date beyond the initial five years required by section 172(a)(2)(A) for an area if the State has not thoroughly considered the implementation of all RACM and RACT local control measures for the area (see section III.I for a more detailed discussion of RACT and RACM). EPA also will examine whether the State has adequately considered measures to address intrastate transport of pollution from sources within its jurisdiction. In attainment planning, States have the obligation and authority to address the transport of pollution from one area of the state to another. Any decision made by EPA to extend the attainment date for an area beyond its original attainment date will be based on facts specific to the nonattainment area at issue and will only be made after providing notice in the **Federal Register** and an opportunity for the public to comment.

#### 5. Areas That Fail To Attain or Do Not Qualify for an Attainment Date Extension

Section 179 of the Act requires that EPA publish a finding in the **Federal Register** for areas that fail to attain by their attainment dates, or that fail to qualify for an attainment date extension. Within one year of EPA's determination that the area failed to attain, the State is then required to submit a SIP revision providing for attainment of the standard as expeditiously as practicable in accordance with section 172(a)(2) of the Act. Section 179(d)(3) provides that the SIP revision must include any specific additional measures as may be prescribed by EPA, including "all measures that can be feasibly implemented in the area in light of technological achievability, costs, and any nonair quality and other air quality-related health and environmental impacts." The EPA believes that in considering the factors above, States that fail to attain the standard initially should give greater weight to technologically feasible measures despite the fact that these measures may

be more costly than those implemented under the previous plan.

#### 6. Determining Attainment for the PM<sub>2.5</sub> Standards

The EPA has the responsibility for determining whether a nonattainment area has attained the standard by its applicable attainment date. Section 179(c)(1) of the Act requires EPA to make determinations of attainment no later than 6 months following the attainment date for the area. Under section 179(c)(2), EPA must publish a notice in the **Federal Register** identifying those areas which failed to attain by the applicable attainment date. The statute further provides that EPA may revise or supplement its determination of attainment for the affected areas based upon more complete information or analysis concerning the air quality for the area as of the area's attainment date.

Section 179(c)(1) of the Act provides that the attainment determination for an area is to be based upon an area's "air quality data as of the attainment date." The EPA will make the determination of whether an area's air quality is meeting the PM<sub>2.5</sub> NAAQS by the applicable attainment date primarily based upon data gathered from the air quality monitoring sites which have been entered into EPA's Air Quality System (AQS) database. No special or additional SIP submittal will be required from the State for this determination.

A PM<sub>2.5</sub> nonattainment area's air quality status is determined in accordance with appendix N of 40 CFR part 50. To show attainment of the 24-hour and annual standards for PM<sub>2.5</sub>, the most recent three consecutive years of data prior to the area's attainment date must show that three-year average PM<sub>2.5</sub> concentrations are at or below the levels of the standards. A complete year of air quality data, as described in part 50, Appendix N, is comprised of all 4 calendar quarters with each quarter containing data from at least 75 percent of the scheduled sampling days. The annual standard for PM<sub>2.5</sub> is attained when the 3-year average annual mean concentration is less than or equal to 15.0 µg/m<sup>3</sup>. The 24-hour standard for PM<sub>2.5</sub> is met when the average of 98th percentile values for three consecutive calendar years at each monitoring site is less than or equal to 65 µg/m<sup>3</sup>.

The EPA will begin processing and analyzing data related to the attainment of PM<sub>2.5</sub> areas immediately after the applicable attainment date for the affected areas. Current EPA policy, under 40 CFR part 58, sets the deadline for submittal of air quality data into the

AQS database for no later than 90 days after the end of the calendar year.

While EPA may determine that an area's air quality data indicates that an area may be meeting the PM<sub>2.5</sub> NAAQS for a specified period of time, this does not eliminate the State's responsibility under the Act to adopt and implement an approvable SIP. If EPA determines that an area has attained the standard as of its attainment date, the area will remain classified as nonattainment until the State has requested, and EPA has approved, redesignation to attainment for the area.

In order for an area to be redesignated as attainment, the State must comply with the five requirements listed under section 107(d)(3)(E) of the Act. Among other things, section 107(d)(3)(E) requires that EPA determine that an area has met the PM<sub>2.5</sub> NAAQS and that the State has submitted a SIP for the area which has been approved by EPA.

#### 7. How Do Attainment Dates Apply to Indian Country?

The Tribal Authority Rule (TAR) at 40 CFR 49.9 provides guidelines by which Tribes may implement air quality programs in a similar manner as States. However, Tribes choosing to implement their own air quality programs are not required to meet the same schedules and deadlines that apply to States, including attainment dates for NAAQS.

In situations where a Tribe chooses to not implement its own air quality program or any element thereof, EPA is required under the TAR to develop a Federal Implementation Plan (FIP) as necessary and appropriate. 40 CFR 49.11. Because public health considerations are of utmost concern, we believe that any FIP for tribal lands should provide for an attainment date that is as expeditious as practicable. Therefore, EPA will work in consultation with the Tribes to ensure that implementation of the standards is conducted as soon as possible taking into consideration the needs of the Tribes, and to ensure that attainment in other jurisdictions is not adversely affected.

#### *D. What Are the Incentives for Achieving Early Reductions of PM<sub>2.5</sub> and Its Precursors?*

There are significant regulatory incentives for achieving early local area emissions reductions. Areas with design values just over the level of the standard may be able to achieve reductions in the local area or in the State so that, when their effect is considered in combination with reductions achieved under national programs, they may be sufficient to attain the standards before

SIPs are due in 2008. For example, if monitoring in a nonattainment area shows that the air quality for 2004–2006 meets the standards, then the area may be subject to reduced regulatory requirements and be redesignated as “attainment.” EPA issued a “Clean Data” policy memorandum in December 2004 describing possible reduced regulatory requirements for areas that attain the standards early, but have not yet been redesignated as attainment.<sup>47</sup> For example, the area also would be relieved of the requirements to implement the nonattainment NSR program otherwise required for nonattainment areas, and instead would implement the PSD program.

Another regulatory incentive for early emissions reductions is credit toward RFP requirements. We issued a guidance memorandum designating 2002 as the base year for emissions inventories for PM<sub>2.5</sub> and 8-hour ozone attainment plans and for regional haze implementation plans.<sup>48</sup> For PM<sub>2.5</sub>, States therefore can take credit for emissions reductions achieved after 2002 in meeting their requirements for RFP. In addition, when developing attainment demonstrations, States should account for these reductions when establishing baseline control scenarios for assessing what additional reductions might be needed to attain the standards.

Examples of possible early reduction programs include efforts to reduce diesel engine emissions (e.g. Clean School Bus USA, retrofits for trucks, locomotives, construction equipment, and marine vessels such as ferries, and diesel idling emissions programs); programs to reduce auto emissions through reduced vehicle miles traveled and improving maintenance of high emitting vehicles; implementation and enforcement of regulations to reduce emissions from burning activities (such as smoke management programs, wood stove retrofit programs, and ordinances to ban open burning of waste or debris from land clearing); energy conservation programs that can reduce demand from power plants; improved emission controls on stationary sources; and

improved compliance assurance monitoring to ensure that stationary source emissions are maintained at the levels demonstrated during emissions performance tests. Additional discussion of possible emission reduction strategies which could be introduced early is included in section III.I. on RACM and RACT.

#### *E. How Should the States and EPA Balance the Need To Address Long-Range Transport of Fine Particle Pollution With the Need for Local Emissions Reductions When Implementing the PM<sub>2.5</sub> Standards?*

##### 1. Clean Air Act Provisions for Achieving Local and Regional Emissions Reductions

Section I provides background on PM<sub>2.5</sub> monitoring data, the geographic distribution of potential nonattainment areas, and the estimated population affected. It also includes a discussion of the regional nature of the PM<sub>2.5</sub> problem.

Section 172(a)(2) of the Act requires States to attain the standards as expeditiously as practicable but within five years of designation (i.e. attainment date of April 2010 based on air quality data for 2007–2009), or within up to ten years of designation (i.e. to 2015) if the EPA Administrator extends an area’s attainment date by 1–5 years based upon the severity of the nonattainment problem and/or the feasibility of implementing control measures.

Virtually all nonattainment problems appear to result from a combination of local emissions and transported emissions from upwind areas. The structure of the CAA requires EPA to develop national rules for certain types of sources which are also significant contributors to local air quality problems, including motor vehicles and fuels. It also provides for States to address emissions sources on an area-specific basis through such requirements as RACT, RACM, and RFP.

We believe that to attain the PM<sub>2.5</sub> standards, it is important to pursue emissions reductions simultaneously on the local, regional, and national levels. As discussed in more detail in section III.I. on RACM and RACT requirements, States will need to evaluate technically and economically feasible emission reduction opportunities at the local level and determine which measures can be reasonably implemented within the nonattainment area. Local and regional emission reduction efforts should proceed concurrently and expeditiously.

In addition, reductions in pollutants that contribute to PM<sub>2.5</sub> can provide

concurrent benefits in addressing a number of air quality problems—such as ozone, regional haze, urban visibility, and toxic air pollutant problems—by reducing common pollutants. Such is the case with programs to reduce diesel emissions, for example. While diesel engines collectively are large sources of NO<sub>x</sub> and direct PM emissions, they also emit significant amounts of toxic air pollutants.<sup>49</sup> Similarly, many sources and activities which lead to direct emissions of organic and elemental carbon (such as open burning and residential wood combustion) also are key sources of toxic air pollutants (i.e. polycyclic aromatic hydrocarbon emissions), and contribute to regional haze as well. Thus, programs and strategies designed to reduce local emissions of PM and its precursors can help reach attainment for the PM<sub>2.5</sub> standards and provide other air quality benefits as well.

##### 2. Regional Emission Reduction Strategies

As stated earlier in section II, the principal regional pollutants contributing to downwind PM<sub>2.5</sub> concentrations in the eastern U.S. are SO<sub>2</sub> and NO<sub>x</sub>. Sulfate formed from SO<sub>2</sub> accounts for about 30–50 percent of PM<sub>2.5</sub> mass in most eastern locations, while ammonium nitrate formed from NO<sub>x</sub> accounts for 6 percent to more than 20 percent in some locations. The EPA implemented phase II of the Acid Rain Program in 2000, setting an emissions cap of 8.95 million tons of SO<sub>2</sub> and bringing the average emission rate for power plants to a level of 1.2 lbs per mmBTU. However, EPA analyses have shown that sulfate and nitrate contribute to nonattainment problems significantly and will remain a large percentage of PM<sub>2.5</sub> concentrations in the eastern U.S. even after full implementation of the Acid Rain Program. In order to address health and environmental problems associated with PM<sub>2.5</sub>, ozone, and mercury deposition, the President has proposed the Clear Skies Act. [The Clear Skies Act of 2003 was introduced in the U.S. House of Representatives (H.R. 999) and the U.S. Senate (S. 485) on February 27, 2003.] It is designed to achieve significant reductions in SO<sub>2</sub>, NO<sub>x</sub>, and mercury emissions from power plants. (For more information, see section I.E.1. above.)

<sup>47</sup> Memorandum of December 14, 2004, from Steve Page, Director, EPA Office of Air Quality Planning and Standards to EPA Air Division Directors, “Clean Data Policy for the Fine Particle National Ambient Air Quality Standards.” This document is available at: <http://www.epa.gov/pmdesignations/guidance.htm>.

<sup>48</sup> Memorandum of November 18, 2002, from Lydia Wegman and Peter Tsigotis, “2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, PM<sub>2.5</sub> and Regional Haze Programs.” This document is available at the following web site: [http://www.epa.gov/ttn/oarpg/t1/memoranda/2002bye\\_gm.pdf](http://www.epa.gov/ttn/oarpg/t1/memoranda/2002bye_gm.pdf).

<sup>49</sup> USEPA. 2002. Health Assessment Document for Diesel Engine Exhaust. The EPA/600/8–90/057F. 01 May 2002. U.S. Environmental Protection Agency, Office of Research and Development, National Center for Environmental Assessment, Washington, DC. Available on EPA’s Web site: <http://cfpub.epa.gov/ncea/>.

Because it is uncertain whether the CSA will be enacted, EPA established the CAIR under the existing CAA to achieve regional reductions of SO<sub>2</sub> and NO<sub>x</sub>. (See section I.E.2. for a discussion of CAIR.) The CAA requires States to develop SIPs that provide for attainment by deadlines in the CAA and requires States to have implementation plans that prohibit emissions that contribute significantly to nonattainment in other States. As described in the **Federal Register** actions for the NO<sub>x</sub> SIP call and section 126 rulemakings, EPA believes it has the authority under the CAA to define what States need to do to address the interstate transport requirements of section 110 in advance of the submission of nonattainment area SIPs. The CAIR program will help many cities throughout the region meet the PM<sub>2.5</sub> standards or make significant progress toward attainment.

Air quality modeling analyses in support of the final CAIR rule show that of the 36 areas currently designated nonattainment for PM<sub>2.5</sub> in the eastern United States, 17 areas are projected to attain the standards by 2010 with implementation of CAIR and other existing federal and state measures. By 2015, 22 areas are projected to attain the standards. While the air quality benefits from implementation of CAIR and other programs are significant, it is also evident that in some areas local emission reduction measures will serve an important role in addressing the PM<sub>2.5</sub> nonattainment problem.

### 3. The Role of Local and State Emission Reduction Efforts in Reducing Health Risks and Achieving the PM<sub>2.5</sub> Standards

As discussed above, the implementation of regional and national strategies (such as CAIR and various mobile source programs) are expected to provide significant air quality improvements for PM<sub>2.5</sub> nonattainment areas. At the same time, analyses for the final CAIR rule indicate that without implementation of local measures, approximately 14 to 19 areas would be projected to remain in PM<sub>2.5</sub> nonattainment status in the 2010–2015 timeframe. Thus, EPA believes that local and State emission reduction efforts will need to play an important role in addressing the PM<sub>2.5</sub> problem as well. EPA intends to work closely with States, Tribes, and local governments to develop appropriate in-state pollution reduction measures to complement regional and national strategies to meet the standards expeditiously and in a cost-effective manner.

Many types of emissions sources contribute to the PM problem, and in

many cases cost-effective measures are available to reduce their emissions. Examples of possible local measures are discussed in the previous section III.D. on early reductions, as well as in section III.I. on RACT and RACM. The EPA has also provided grant funding to STAPPA/ALAPCO to develop a “menu of options” document to provide State and local agencies and the general public with additional information on sources of emissions, potential control measures, and their associated costs and air quality benefits.

EPA encourages States to implement technologically available and economically feasible local measures expeditiously. States can adopt a number of programs now, or expand their level of implementation of existing programs, in order to achieve local area emissions reductions in the near term. While regional emissions reductions may have a lower cost per ton of emissions reduced than many local reductions, local reduction opportunities may be more readily available, they may be more feasible to implement in a shorter period of time than a broad regional emissions trading program, and they may have high benefits per ton of emission reduction. In addition, local emissions reductions can be especially beneficial in reducing exposure to air pollution for dense urban populations. Thus, by taking action in advance of the date that regional reductions may be achieved, local communities can enjoy the benefits of improved public health (including a reduction in health care costs).

Preliminary EPA analyses<sup>50</sup> show that if local emissions reductions (e.g., including SO<sub>2</sub> and other local emissions) were obtained only from sources located within metro areas projected to be nonattainment, the average air quality improvement in these cities would be 1.26 µg/m<sup>3</sup>, and the number of counties projected to have violating monitors in 2010 would decrease from 61 to 26. These analyses also show that if local emissions reductions were limited to pollutants other than SO<sub>2</sub>, the average air quality improvement in these cities would be 0.37 µg/m<sup>3</sup>, and the number of counties projected to have violating monitors in 2010 would decrease from 61 to 48. Thus, these analyses support the conclusion that emissions reductions due to regional and national programs such as CAIR and recently promulgated

<sup>50</sup> See discussion of local control measures in the proposed CAIR, 69 FR 4596–4599, and associated supporting information (docket #OAR–2003–0053, item #OAR–2003–0053–0162, Technical Support Document for the CAIR, Modeling Analyses).

national rules for mobile sources will make important contributions to attainment for many eastern nonattainment areas. In the absence of regional controls on upwind sources, downwind States would be forced to obtain greater emissions reductions, and incur greater costs, to offset the transported pollution from upwind sources. At the same time, this preliminary analysis also illustrates that local emissions reductions can be beneficial, and have the potential to bring a number of metropolitan areas into attainment.

EPA believes that expeditiously achieving the PM<sub>2.5</sub> reductions that are available from reasonable local controls is important because, as discussed in section I.A., the effects of PM<sub>2.5</sub> on public health are serious. Estimates suggest that each year tens of thousands of people die prematurely from exposure to PM<sub>2.5</sub>, and many hundreds of thousands more people experience significant respiratory or cardiovascular effects. Even small reductions in PM<sub>2.5</sub> levels may have substantial health benefits on a population level. For example, in a moderate-sized metropolitan area with a design value of 15.5 µg/m<sup>3</sup>, efforts to improve annual average air quality down to the level of the standard (15.0 µg/m<sup>3</sup>) may be expected to result in as many as 25–50 fewer mortalities per year due to air pollution exposure. In a smaller city, the same air quality improvement from 15.5 to 15.0 µg/m<sup>3</sup> still may be expected to result in a number of avoided mortalities per year. These estimates are based on EPA’s standard methodology for calculating health benefits as used in recent rulemakings.<sup>51</sup>

The benefits of PM<sub>2.5</sub> control also are significant in dollar terms. Depending on the particular emission controls on sources of PM<sub>2.5</sub> precursor emissions, EPA has estimated that the monetized health benefits of reducing emissions of pollutants that lead to PM<sub>2.5</sub> formation exceed the costs by 3 to over 30 times.<sup>52</sup>

<sup>51</sup> These estimates are based on the relative risk for all-cause mortality from the Pope et al. 2002 analysis of the American Cancer Society cohort. The EPA standard methodology for estimating health benefits has been used in developing regulatory impact analyses for a number of regulations. Most recently, this methodology was used in support of the CAIR (docket #OAR–2003–0053, item #OAR–2003–0053–0175, Benefits of the Proposed CAIR, January 2004).

<sup>52</sup> U.S. EPA, 2005. Regulatory Impact Analysis for the Clean Air Interstate Rule. EPA 452/–03–001. Prepared by Office of Air and Radiation. Available at: <http://www.epa.gov/interstateairquality/tsd0175.pdf>. See also: U.S. Environmental Protection Agency, 2004. Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines. EPA420–R–04–007. Prepared by Office of Air and Radiation. Available at <http://www.epa.gov/nonroad-diesel/2004fr/420r04007.pdf>.



As discussed in more detail in section III.I. on RACM and RACT requirements, States will need to evaluate technically and economically feasible emission reduction opportunities at the local level and determine which measures can be reasonably implemented within the nonattainment area. To avoid the public health consequences of delayed improvements in PM<sub>2.5</sub> concentrations, we believe that local and regional emission reduction efforts should proceed concurrently and expeditiously.

Although direct emissions may appear relatively small in tonnage terms, States should not overlook reductions of direct local emissions, particularly carbonaceous emissions. Monitoring data show that many urban areas have higher levels of carbonaceous PM<sub>2.5</sub> than rural areas. Based on information developed by EPA in support of regulations on diesel engines, the population weighted impact per ton of direct PM diesel emissions reduced is estimated to be about 9–14 times more effective in reducing health effects as compared to SO<sub>2</sub> and NO<sub>x</sub> reductions from the same sources.<sup>53</sup> This analysis reflects the fact that by definition, all of the direct fine particle emissions contribute to PM<sub>2.5</sub> concentrations, but only a fraction of the SO<sub>2</sub> and NO<sub>x</sub> emissions undergo reactions in the atmosphere to become PM<sub>2.5</sub>.

In addressing a nonattainment area having military training, testing and operational activities occurring within it, the State should not need to target these activities for emission reductions. Regarding prescribed burning activities, EPA intends to continue implementation of the Interim Air Quality Policy on Wildland and Prescribed Fires.<sup>54</sup>

#### 4. Addressing Regionally Transported Emissions in Local Area Attainment Demonstrations

As discussed in section III.C., the CAA requires States with PM<sub>2.5</sub> nonattainment areas to attain the standards as expeditiously as practicable, but no later than within five years of designation (e.g., April 2010). If the State provides an adequate demonstration showing that it cannot attain the standards within five years, based on the severity of the area's

problem, the availability of control measures, and the feasibility of implementing controls, then EPA may grant the area an attainment date extension of one to five years.

Now that the multi-state CAIR emission reduction program has been adopted well before the PM<sub>2.5</sub> SIPs are due, it will be important for affected States to take into account the incremental projected emissions reductions resulting from that program in assessing the degree of air quality improvement that can be expected in the State and the projected timetable for those reductions to be realized.

Experience with implementation of the cap-and-trade and emissions banking provisions of the Acid Rain Program has shown that certain sources likely will take steps to reduce emissions and “bank” emissions allowances prior to the date that compliance with the initial emissions cap is required.

Under a trading program with an emissions banking provision, we estimate that SO<sub>2</sub> emissions will be reduced on a steadily decreasing glidepath rather than a stair step pattern. By 2009, the last year prior to the 2010 attainment year, a portion of the total regional SO<sub>2</sub> emissions reductions expected under CAIR would be realized. In developing their SIPs, States should use existing projections of the geographic distribution and magnitude of early emissions reductions that are expected to be achieved by 2009 using existing information from the IPM emissions projection model. They should also assess the associated impact of these reductions on air quality by using a regional air quality model. We encourage the States to use existing analyses to the extent possible to project interim air quality improvements from regional emissions reduction strategies, and we commit to working with the States and regional planning organizations to evaluate the expected air quality improvements from CAIR. In addition, states must assess the effect of potential RACM, including RACT, in determining an appropriate attainment date. We will work with the States as they develop attainment demonstrations and SIPs designed to attain the standards as expeditiously as practicable, taking into account emissions reductions from broad regional programs (such as the CAIR and NO<sub>x</sub> SIP Call); national measures such as new emissions standards for cars and trucks; and other cost effective State and local strategies which may advance the attainment date.

#### F. How Will EPA Address Requirements for Modeling and Attainment Demonstration SIPs When Implementing the 24-Hour and Annual Average PM<sub>2.5</sub> Standards?

##### 1. Introduction

Section 172(c) requires States with nonattainment areas to submit an attainment demonstration. An attainment demonstration consists of: (1) Technical analyses that locate, identify, and quantify sources of emissions that are contributing to violations of the PM<sub>2.5</sub> NAAQS; (2) analyses of future year emissions reductions and air quality improvement resulting from already-adopted national and local programs, and from potential new local measures to meet the RACT, RACM, and RFP requirements in the area; (3) adopted emission reduction measures with schedules for implementation; and (4) contingency measures required under section 172(c)(9) of the CAA. with a nonattainment area will have to submit a SIP with an attainment demonstration that includes analyses supporting the State's proposed attainment date. The State must show that the area will attain the standards as expeditiously as practicable, and it must include an analysis of whether implementation of reasonably available measures will advance the attainment date.

##### 2. Areas That Need To Conduct Modeling

Some areas having design values close to the standard may be projected to come into attainment within five years based on modeling analyses of national and regional emission control measures that are scheduled to occur through 2009. Regional scale modeling for national rules such as the Tier II motor vehicle standards, the Heavy-duty Engine standards and the Nonroad Engine standards indicate major reductions in PM<sub>2.5</sub> by 2010. A portion of these benefits will occur in the 2004–2009 PM<sub>2.5</sub> attainment timeframe.

Experience with past ozone attainment demonstrations has shown that the process of performing detailed photochemical grid modeling to develop an attainment demonstration can be very resource intensive for States. The EPA believes that it would be appropriate for States to leverage resources by collaborating on modeling analyses to support SIP submittals, or by making use of recent modeling analyses that have already been completed. For this reason, EPA proposes that States may use in a PM<sub>2.5</sub> attainment demonstration certain local, regional and/or national modeling analyses that

<sup>53</sup> “Estimated NO<sub>x</sub>, SO<sub>2</sub>, and PM Emissions Health Damages for Heavy-duty Vehicle Emissions.” April 22, 2002. Memorandum by Bryan Hubbell, EPA Office of Air Quality Planning and Standards, to docket A–2000–01, docket item IV–A–146.

<sup>54</sup> USEPA, “Interim Air Quality Policy on Wildland and Prescribed Fires,” memorandum from Richard Wilson, Acting Assistant Administrator for Air and Radiation, to Regional Administrators, May 15, 1998.

have been developed to support Federal or local emission reduction programs, provided the modeling meets the attainment modeling criteria set forth in EPA's modeling guidance (described below). As with all SIPs under subpart 1, the State must demonstrate that the area will attain the PM<sub>2.5</sub> standards as expeditiously as practicable. As part of this demonstration, the State must evaluate those technically and economically feasible measures in the nonattainment area in order to determine whether, if implemented together, these measures would advance the attainment date. (This evaluation of local measures may or may not involve additional modeling.) The EPA proposes that if the State can rely on existing modeling analyses as part of its attainment demonstration, it should reference appropriate reports on that modeling which are readily available, or include the modeling documentation in its submittal. In such situations, the State must provide an explanation describing how it meets the criteria for attainment-level modeling, and why the existing modeling is appropriate for use as part of the attainment demonstration. The EPA requests comment on this proposed approach for using existing air quality modeling analyses in attainment demonstrations, where appropriate.

Nonattainment areas would be required to submit an attainment demonstration SIP that includes new modeling showing attainment of the standards as expeditiously as practicable. The new modeling will need to include additional emissions controls or measures in order to demonstrate attainment.

### 3. Modeling Guidance

Section 110(a)(2)(K)(i) states that SIPs must contain air quality modeling as prescribed by the Administrator for the purpose of predicting the effect of emissions on ambient air quality. The procedures for modeling PM<sub>2.5</sub> as part of an attainment SIP are contained in EPA's "DRAFT Guidance for Demonstrating Attainment of Air Quality Goals for PM<sub>2.5</sub> and Regional Haze."<sup>55</sup> The EPA welcomes public comments on the guidance at any time and will consider those comments in any future revision of the document. Comments submitted on the modeling guidance document should be identified as such and will not be docketed as part of this rulemaking, nor will a comment/response summary of these comments

<sup>55</sup> "DRAFT Guidance for Demonstrating Attainment of Air Quality Goals for PM<sub>2.5</sub> and Regional Haze" can be found at: [http://www.epa.gov/scram001/guidance/guide/draft\\_pm.pdf](http://www.epa.gov/scram001/guidance/guide/draft_pm.pdf).

be a part of the final PM<sub>2.5</sub> implementation rule since they will not affect the rule itself. The final version of the guidance is scheduled for release in 2005 and will be posted on EPA's web site (<http://www.epa.gov/ttn/scram/>).

The draft modeling guidance describes how to estimate whether a control strategy to reduce emissions of particulate matter and its precursors will lead to attainment of the annual and 24-hour PM<sub>2.5</sub> NAAQS. Part I of the guidance describes a "modeled attainment test" for the annual and 24-hour PM<sub>2.5</sub> NAAQS. Both tests are similar. The output of each is an estimated future design value consistent with the respective forms of the NAAQS. If the future design value does not exceed the concentration of PM<sub>2.5</sub> specified in the NAAQS, the test is passed. The modeled attainment test applies to locations with monitored data.

A separate test is recommended to examine projected future year PM<sub>2.5</sub> concentrations in unmonitored locations.<sup>56</sup> Interpolated PM<sub>2.5</sub> ambient data combined with modeling data can be used to predict PM<sub>2.5</sub> concentrations in unmonitored areas. The details of such an analysis will be contained in the final modeling guidance.

States may use other analyses in addition to the modeled attainment test and hot spot analysis to estimate whether future attainment of the NAAQS is likely. Attainment is likely if a preponderance of evidence suggests so. This procedure is called a "weight of evidence determination."

Reliability of recommended tests for estimating future attainment depends on having reliable data bases. The guidance identifies and prioritizes key data gathering activities and analytical capabilities which will increase credibility of analyses used to estimate if the air quality goals for PM<sub>2.5</sub> will be met.

Part II of the guidance describes how to apply air quality models to generate results needed by the modeled tests for attainment. This includes developing a conceptual description of the problem to be addressed; developing a modeling/analysis protocol; selecting an appropriate model to support the demonstration; selecting appropriate meteorological episodes or time periods to model; choosing an appropriate area to model with appropriate horizontal/vertical resolution; generating meteorological and air quality inputs to

<sup>56</sup> The unmonitored area attainment test will be limited to locations which are appropriate to allow the comparison of predicted PM<sub>2.5</sub> concentrations to the NAAQS, based on PM<sub>2.5</sub> monitor siting requirements and recommendations.

the air quality model; generating emissions inputs to the air quality model; evaluating performance of the air quality model; and performing diagnostic tests. After these steps are completed, the model is used to simulate effects of candidate control strategies.

EPA is not recommending a specific model for use in the attainment demonstration for the PM<sub>2.5</sub> NAAQS. At present, there is no single model which has been extensively tested and shown to be clearly superior to other available models. The current modeling guideline, 40 CFR part 51, appendix W does not identify a "preferred model" for use in attainment demonstrations of the NAAQS for PM<sub>2.5</sub>. Thus, States may choose from several alternatives. The EPA's draft modeling guidance provides a set of general requirements which an air quality model should meet to qualify for use in an attainment demonstration for the PM<sub>2.5</sub> NAAQS. These include having received a scientific peer review, being applicable to the specific application on a theoretical basis, and having an adequate data base to support its application.

In some cases, multiple models may need to be applied in the attainment demonstration. In most cases, a photochemical grid model is needed to treat secondary particulate matter. Photochemical grid models can also be used to treat primary particulate. In high concentration areas of primary particulate, however, a Gaussian plume model or puff model may also be needed to more accurately represent steep concentration gradients. The modeling guidance provides details and recommendations on using multiple models.

The application of air quality models requires a substantial effort by State agencies and EPA. Therefore, States should work closely with the appropriate U.S. EPA Regional Offices in executing each step of the modeling process. By doing so, it will increase the likelihood of EPA approval of the State demonstration submitted at the end of the modeling and overall SIP development process.

### 4. Modeled Attainment Test

The two modeled attainment tests for the annual and 24-hour standards use monitored data to estimate current air quality. The attainment test for a given standard is applied at each monitor location within or near a designated nonattainment area for that standard. There is also an additional attainment test to be performed in unmonitored areas. Models are used in a relative sense to estimate the response of

measured air quality to future changes in emissions. Future air quality is estimated by multiplying current monitored values times modeled responses to changes in emissions. Because PM<sub>2.5</sub> is a mixture of chemical components, States should use current observations and modeled responses of major components of PM<sub>2.5</sub> to estimate future concentrations of each component. The predicted future concentration of PM<sub>2.5</sub> is the sum of the predicted component concentrations.

Direct application of the modeled attainment tests requires speciated PM<sub>2.5</sub> ambient data co-located with FRM sites. However, there will not be speciation monitors at every FRM site. In fact, speciation monitors are only located at approximately 20 percent of the FRM monitoring sites. Therefore EPA is developing a refinement of the modeled attainment test that uses interpolated ambient speciation data to calculate current values of PM<sub>2.5</sub> species at all of the FRM monitoring sites. Gridded spatial fields of interpolated speciated PM<sub>2.5</sub> data are created in order to estimate the species fractions at each FRM site. This information, combined with modeling results, may be used to calculate future air quality at each FRM monitoring site.

An application of this methodology was employed and documented as part of EPA's Clean Air Interstate Rule (CAIR). The final modeling guidance will contain default recommendations for the disaggregation and treatment of PM<sub>2.5</sub> species for the purpose of applying the modeled attainment test.

#### 5. Multi-Pollutant Assessments and One-Atmosphere Modeling

A multi-pollutant assessment, or one-atmosphere modeling, is conducted with a single air quality model that is capable of simulating transport and formation of multiple pollutants simultaneously. For example, this type of model simulates the formation and deposition of PM<sub>2.5</sub>, ozone, and regional haze components, and it includes algorithms simulating gas phase chemistry, aqueous phase chemistry, aerosol formation, and acid deposition.

Multipollutant assessments are recommended for PM<sub>2.5</sub> attainment demonstrations because the formation and transport of PM<sub>2.5</sub> is closely related to the formation of both regional haze and ozone. The components of PM<sub>2.5</sub> account for the vast majority of visibility impairment associated with regional haze. For any given mass, fine particles are more efficient at scattering light than particles larger than 2.5 micrometers in diameter, and certain components of PM<sub>2.5</sub> are more efficient at scattering or

absorbing light than others. The most efficient light-scattering particle types are secondary particulate species such as sulfates and nitrates. Primary particles composed of crustal and other inorganic material are less efficient at scattering light. Secondary particulate matter comprises a significant fraction of measured PM<sub>2.5</sub> in most parts of the country, and therefore is a significant contributor to regional haze. The impact of fine particles on visibility is enhanced still further by high relative humidity, which is especially relevant in the Eastern U.S., because sulfates and nitrates commonly absorb water and grow to sizes comparable to the wavelengths of visible light.

There is often a positive correlation between measured ozone and secondary particulate matter. Many of the same factors affecting concentrations of ozone also affect concentrations of secondary particulate matter. For example, similarities exist in sources of precursors for ozone and secondary particulate matter. Emissions of NO<sub>x</sub> may lead to formation of nitrates as well as ozone. Sources of VOC may be sources or precursors for both ozone and organic particles. Presence of ozone itself may be an important factor affecting secondary particulate formation. For example, as ozone builds up, hydroxyl (OH) radicals do also as a result of equilibrium reactions between ozone, water and OH in the presence of sunlight. Hydroxyl (OH) radicals are instrumental in oxidizing gas phase SO<sub>2</sub> to sulfuric acid, which is eventually absorbed by liquid aerosol and converted to particulate sulfate in the presence of ammonia. SO<sub>2</sub> also reacts with ozone and hydrogen peroxide (a byproduct of photochemistry), in the aqueous phase, to form particulate sulfate. Hydroxyl radicals and NO are also precursors for gas phase nitric acid, which is absorbed by liquid aerosol and, in the presence of ammonia, leads to particulate nitrate.

Strategies to reduce ozone can also affect formation of secondary PM. Reducing VOC emissions could reduce ozone, OH, and/or hydrogen peroxide. If sulfate or nitrate production is limited by lack of availability of oxidizing agents, the ozone reduction strategy could also reduce secondary PM. Recent research has also shown increased secondary organic aerosol concentrations in the presence of acid aerosols. Reductions in oxidizing agents may lead to lower concentrations of sulfate and/or nitrate which may lead to reduced levels of secondary organic

aerosols. Control of certain VOCs<sup>57</sup> may also reduce secondary organic aerosols by reducing their semi-volatile precursors. Reducing NO<sub>x</sub> emissions diminishes one of the precursors for nitric acid (*i.e.*, NO<sub>2</sub> which results from NO). Therefore, in the presence of sufficient ammonia, reducing NO<sub>x</sub> emissions could reduce particulate nitrate concentrations. There are also more subtle interfaces between strategies to reduce ozone and to reduce secondary particulate matter. For example, reducing NO<sub>x</sub> in the presence of substantial particulate sulfates and lack of sufficient ammonia could in some cases exacerbate the particulate sulfate problem, or reducing SO<sub>2</sub> in the presence of substantial NO<sub>x</sub> and ammonia could in some cases exacerbate the particulate nitrate problem.

Therefore, models and data analysis intended to address PM<sub>2.5</sub> should also address visibility impairment. These models also need to be capable of simulating transport and formation of ozone. At a minimum, modeling should include previously implemented or planned measures to reduce ozone, PM, and visibility impairment. An integrated assessment of the impact controls have on ozone, PM<sub>2.5</sub>, and regional haze provides safeguards to ensure that optimal emission reduction strategies are developed for the three programs to the extent possible. States that undertake multi-pollutant assessments as part of their attainment demonstration should assess the impact of their PM<sub>2.5</sub> strategies on visibility and ozone, or perform a consistent analysis for PM<sub>2.5</sub>, visibility, and ozone. To facilitate such an effort, EPA encourages States to work closely with established regional haze Regional Planning Organizations (RPOs) and the jurisdictions responsible for developing ozone implementation plans.

#### 6. Which Future Year(s) Should be Modeled?

The concept of simultaneously modeling control impacts on PM<sub>2.5</sub>, regional haze, and ozone may be further facilitated by the alignment of the implementation process for ozone, regional haze, and PM<sub>2.5</sub>. To the extent that dates for attainment demonstration SIPs coincide, the practicality of using common data bases and analysis tools for all three programs becomes more viable and encourages efficient use of resources.

<sup>57</sup> Certain VOCs (especially aromatic compounds) with >6 carbon atoms may form secondary organics aerosols.

In some cases the attainment dates for areas that are classified as nonattainment for both the 8-hour ozone NAAQS and the PM<sub>2.5</sub> NAAQS will coincide. In other cases they may differ by one or more years. The choice of the future modeling year should take into account the local attainment dates for PM<sub>2.5</sub> and ozone as well as the attainment dates of nearby nonattainment areas within the State and/or nearby areas or regions. Where possible, future modeling years should be coordinated so that a single year can be used for both PM<sub>2.5</sub> and ozone modeling. This coordination will help to reduce resources expended for individual modeling applications for PM<sub>2.5</sub> and ozone and will facilitate simultaneous evaluation of ozone and PM impacts.

Although there is some flexibility in choosing the future year modeling time periods, unless the State believes it cannot attain the standards within five years of the date of designation and must request an attainment date extension, the choice of modeling years for PM<sub>2.5</sub> cannot go beyond the initial five year attainment period. For example, if a nonattainment area has an ozone nonattainment date that is beyond the 5 year PM<sub>2.5</sub> period, the area cannot show attainment of the PM<sub>2.5</sub> NAAQS by modeling the later ozone attainment date. In this case, the State could model an earlier year for both PM<sub>2.5</sub> and ozone.

Attainment date extensions will only be granted under certain circumstances. Among other things, the State must submit an attainment demonstration showing that attainment within 5 years of the designation date is impracticable. Section III.C. includes further discussion on attainment date issues.

Further details on choosing future modeling years is contained in EPA's draft modeling guidance. Further revisions to the guidance are expected to address the needed flexibility in choosing future modeling years.

#### 7. Mid-Course Review

A MCR is a process by which the State assesses whether a nonattainment area is or is not making sufficient progress toward attainment of the PM<sub>2.5</sub> standards, as predicted in its attainment demonstration. Such a review would evaluate the most recent monitoring and other data to assess whether the control measures relied on in a State's attainment demonstration have resulted in adequate improvement in air quality.

In reviewing each attainment demonstration, EPA will assess on a case-by-case basis whether a MCR would be needed. EPA will consider a

number of factors in making this determination, including: The length of time to the proposed attainment date; the supporting information provided in the attainment demonstration; and uncertainties associated with future projections of pollutant emissions, air quality levels, and related information.

Where EPA finds that a MCR would be required, the approval of the demonstration would be contingent on a commitment from the State to conduct the MCR. For such cases, the EPA believes that a commitment to perform a MCR is a critical element in an attainment demonstration that employs a long-term projection period. Because of the uncertainty in long term projections, EPA believes such attainment demonstrations should contain provisions for periodic review of monitoring, emissions, and modeling data to assess the extent to which refinements to emission control measures are needed.

In reviewing individual attainment demonstrations, EPA will give particular consideration to requiring a MCR for areas that are granted an extension of their attainment date of two years or more beyond the first five year period. For areas where the effective date of designations is April 2005, the MCR requirement would then apply to areas with attainment date extensions to April 2012 to April 2015. The EPA would require submittal of the MCR within five years of the effective date of designations.

The procedure for performing a MCR contains three basic steps: (1) Demonstrate whether the appropriate emission limits and emission reduction programs that were approved as part of the original attainment demonstration and SIP submittal were adopted and implemented; (2) analyze available air quality, meteorology, emissions and modeling data and document relevant findings; and (3) document conclusions regarding whether progress toward attainment is being made using a weight of evidence determination. This determination may or may not include new modeling analyses.

The EPA does not request that States commit in advance to adopt new control measures as a result of the MCR process. Based on the MCR, however, if EPA determines that sufficient progress has not been made, EPA would determine whether additional emissions reductions are necessary from the State or States in which the nonattainment area is located, or from upwind States, or both. The EPA would then require the appropriate State or States to adopt and submit the new measures within a specified period. The EPA anticipates

that these findings would be made as calls for SIP revisions under section 110(k)(5), and therefore the period for submission of the measures would be no longer than 18 months after the EPA finding. Thus, States must complete the MCR three or more years before the applicable attainment date to ensure that any additional controls that may be needed can be adopted in sufficient time to reduce emissions by the attainment year.

A number of States previously participated in a consultative process with EPA which resulted in the development of the 1-hour ozone MCR guidance.<sup>58</sup> If a MCR will be required for certain PM<sub>2.5</sub> nonattainment areas, separate PM<sub>2.5</sub> MCR guidance will be written to address the specific requirements of PM<sub>2.5</sub> nonattainment areas.

#### G. What Requirements for RFP Apply Under the PM<sub>2.5</sub> Implementation Program?

##### 1. Background

Section 172(c)(2) provides that nonattainment area plans "shall require reasonable further progress." Section 171(1) defines "reasonable further progress," as "such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the Administrator for the purpose of ensuring attainment of the applicable national ambient air quality standard by the applicable date." This section presents how EPA will implement the RFP requirement, and it proposes the criteria by which EPA will judge State submittals addressing this requirement. The approaches proposed here should ensure emissions reductions on a path towards attainment which will yield an incremental improvement in air quality, while being sufficiently flexible to accommodate the range of control strategies necessary to address the complex mixtures of pollutants comprising PM<sub>2.5</sub> in different areas.

EPA has previously described its interpretation of RFP requirements applicable to particles with a nominal aerodynamic diameter of 10 micrometers and smaller (PM<sub>10</sub>).<sup>59</sup> The

<sup>58</sup> Memorandum of March 28, 2002, from Lydia N. Wegman and J. David Mobley, re: "Mid-Course Review Guidance for the 1-Hour Ozone Nonattainment Areas that Rely on Weight-of-Evidence for Attainment Demonstration." Located at URL: <http://www.epa.gov/scram001/guidance/guide/policymem33d.pdf>.

<sup>59</sup> EPA issued general guidance for moderate PM<sub>10</sub> nonattainment areas in the General Preamble on CAA Title I provisions, published April 16, 1992, at 57 FR 13498. (See 57 FR 13539). Further guidance by EPA (published August 16, 1994 at 59

guidance for serious PM<sub>10</sub> nonattainment areas included extensive discussion of the need for incremental reductions to provide RFP. According to the criteria described in that guidance, PM<sub>10</sub> nonattainment areas are expected to implement an ongoing series of measures providing steady progress toward attainment. It is important that reductions needed to attain the standards not be achieved only in the last year or two prior to the attainment date. The EPA believes that these principles should also apply in achieving RFP for the PM<sub>2.5</sub> standards.

## 2. What Is the Baseline Year From Which States Will Track Emission Reductions for Meeting RFP Requirements?

EPA issued a memorandum identifying 2002 as the appropriate emission inventory base year for purposes of addressing the RFP and SIP planning requirements under the implementation programs for the 8-hour ozone and the PM<sub>2.5</sub> standards.<sup>60</sup> The EPA selected 2002 as the appropriate inventory base year for RFP and attainment demonstration purposes for several reasons. First, the inventory for 2002 will be the most recently available consolidated emissions inventory available at the time EPA promulgates PM<sub>2.5</sub> designations. Under the "Consolidated Emissions Reporting Rule" (June 10, 2002, 67 FR 39602), emissions inventories are required every three years, including the years 2002 and 2005.

Second, with a 2002 base year, States will receive credit for reductions from the 2002 base year forward. The policy provides an incentive for State and local agencies to achieve early emissions reductions, and it gives appropriate credit for projected future reductions from certain already-adopted national, regional, and local measures. Third, EPA designated nonattainment areas based on air quality data for the 2001 to 2003 period. Emissions inventories for 2002 should be representative of the period on which States and EPA establish nonattainment area designations. For all these reasons, EPA proposes that the base year inventory for attainment and RFP planning should be 2002.

FR 41997) described RFP requirements for serious PM<sub>10</sub> nonattainment areas. (See 59 FR 42015.)

<sup>60</sup>Memorandum of November 18, 2002, from Lydia Wegman and Peter Tsigotis, "2002 Base Year Emission Inventory SIP Planning: 8-hr Ozone, PM<sub>2.5</sub> and Regional Haze Programs." This document is available at the following web site: [http://www.epa.gov/ttn/oarpg/t1/memoranda/2002bye\\_gm.pdf](http://www.epa.gov/ttn/oarpg/t1/memoranda/2002bye_gm.pdf).

## 3. How Does EPA Propose to Address the Pollutants Associated With PM<sub>2.5</sub> in these RFP Requirements?

Ambient PM<sub>2.5</sub> is a complex mixture containing multiple components. In many areas more than half of the PM<sub>2.5</sub> mass collected by speciation monitors arises not from direct particle emissions but rather from emissions of precursors that undergo atmospheric transformation into particles. Section II.E. takes comment on options for addressing PM<sub>2.5</sub> precursors, and the pollutants required to be addressed in RFP plans will be determined in the final rule. As proposed, the pollutants that are to be addressed in all RFP plans for PM<sub>2.5</sub> are direct PM<sub>2.5</sub> (including organic carbon, elemental carbon, and crustal material), sulfur dioxide, and nitrogen oxides. Ammonia and/or VOCs should be addressed in the RFP plan if ammonia and/or VOC emission reduction strategies are included in the attainment demonstration.

## 4. What Areas Must Submit an RFP Plan?

Under this proposed RFP approach, an area's RFP requirement would be considered to be met if its attainment demonstration (due by April 2008) shows that the area will attain the standards within 5 years of its nonattainment designation (i.e. by April 2010). An area submitting an attainment demonstration indicating that it will not attain by April 2010 must submit an RFP plan by April 2008 along with its attainment demonstration. The RFP plan must show how the area will make reasonable progress toward attainment with periodic 3-year milestones. Subsection (a) discusses areas projected to attain by April 2010. Subsection (b) discusses areas projected to attain after April 2010.

### a. Areas Projected To Attain Within 5 Years of Designation

Under this option, an area that the State projects will attain within five years of designation (i.e. April 2010) will be considered to have met the RFP requirement through submission of all regulations and emissions reductions necessary to demonstrate attainment as expeditiously as practicable. For such areas, attainment-level emissions must be achieved during 2009. It would be assumed that adequate interim progress is already being made in the area since the area would be projected to attain within a relatively short period of time—only two years from the date of SIP submittal. This option provides a flexible interpretation of RFP ("annual incremental emission reductions") in

order to minimize additional regulatory burden on State and local agencies. It is consistent with the approach taken for "subpart 1 areas" in the implementation rule for the 8-hour ozone program. How a State projects that an area will attain the standards within five years is a critical issue in implementing this approach and one on which EPA seeks comment. For example, should State projections of attainment be based on regional modeling conducted for major regulatory analyses (such as for CAIR), or should State projections only be based on local modeling analyses performed with a finer grid resolution and more refined local emission inventory inputs? EPA proposes that States must follow the Agency's most recent modeling guidance for PM<sub>2.5</sub> implementation in developing such projections. Section III.F. includes an in-depth discussion about modeling guidance and attainment demonstrations, and it requests comment on a number of related issues.

### b. Areas Projected To Attain More Than 5 Years From the Date of Designation Must Submit a 2008 RFP Plan

Under this approach, EPA proposes that for any area for which the State submits an attainment demonstration in April 2008 requesting an attainment deadline extension beyond April 2010,<sup>61</sup> the state also must submit an RFP plan along with the area's attainment plan. This 2008 RFP plan must show that the area will achieve generally linear progress according to emission reduction milestones the State establishes for 2010 and every 3 years thereafter until the attainment year. Just as attainment is determined by evaluating air quality data for previous years, compliance with an RFP milestone would be determined by evaluating emissions from the previous year. Thus, any reference to an RFP milestone in this section refers to annual emissions levels achieved during the previous year and prior to January 1 of the milestone year.

The following sections III.G.4.b.i. through III.G.4.b.iv. describe the proposed 2008 RFP plan option under a scenario where there is no classification system. Section III.G.4.b.v. discusses a potential 2008 RFP plan approach for "serious" areas under a two-tiered classification system. As described in

<sup>61</sup>Section 172(a)(2)(A) allows EPA to provide extensions of 1 to 5 years based on an adequate demonstration by the State. Attainment deadline extensions under section 172(a)(2)(C), which extend the attainment deadline by up to a total of 2 additional years to confirm preliminary monitoring data indicating attainment, would not trigger the requirement for the second RFP plan.

section III.A., a serious area would be one that could not demonstrate that it would attain the standards within the first five years after designation, or one with a design value above a particular threshold.

i. For purposes of the 2008 RFP plan, how should a nonattainment area define its emission reduction milestones?

The deadline for submittal of the 2008 RFP plan is the same as the deadline for submittal of the attainment plan, i.e. three years after designations. In developing their RFP plans and emission reduction targets for specific nonattainment areas, States should use the emission inventories and air quality modeling they have completed for attainment planning purposes. EPA expects the attainment plan would define several elements of the 2008 RFP plan. First, the attainment plan will define the pollutants that are to be reduced for attaining the standards. Second, the attainment plan will define the relationship between emissions reductions and air quality improvement, including identifying the emissions reductions by pollutant which are needed to attain the standard. Third, the attainment plan will define the expected attainment year, thereby defining the number of years over which the reductions leading to attainment must occur.

EPA proposes that the 2008 RFP plan must provide emission reduction and program implementation milestones to be achieved by January 1, 2010 (based on the 2009 emissions year), and, if necessary, milestones to be achieved by January 1, 2013 (based on the 2012 emissions year). As part of the plan, the State also should include a motor vehicle emissions budget for each milestone year. The motor vehicle emissions budget should only apply to emissions attributed to vehicles in the nonattainment area. (See section III.K. for further discussion of transportation conformity issues.)

Under Section 172(a)(2)(A), EPA may extend the attainment deadline to as late as April 2015 (for areas where the effective date of designations is April 2005), based on an acceptable demonstration. Thus, 2014 is the latest year in which attainment level emissions are to be achieved. The EPA proposes to define RFP as emissions reductions that would be estimated to provide generally linear progress toward attainment from the 2002 base year emissions to the emissions year prior to the attainment date. The States have flexibility in meeting RFP goals with alternative emission reduction and air quality improvement scenarios.

An important element of establishing appropriate RFP milestones for addressing PM<sub>2.5</sub> is establishing the relative degrees of control of various pollutants. The following subsection describes how EPA proposes to assure that the plans provide for the necessary air quality improvement and yet provide flexibility for addressing a variety of situations of relative feasibility and significance of controlling various pollutants.

ii. For what pollutants must States reduce emissions?

One approach for achieving RFP is to address all pollutants, including direct PM and all precursors, on the same timetable. However, EPA recognizes that different control measures address different pollutants, and States can implement some measures more quickly than others. Therefore, EPA's proposal for 2008 RFP plan requirements includes two components: (1) A benchmark set of pollutant reductions that establish the overall level of control that the 2010 milestones must provide; and (2) an equivalency process that allows States the flexibility to address different pollutants according to different schedules so long as the EPA finds the net air quality improvements to be equivalent.

The RFP benchmark reflects reductions only for those pollutants that the State intends to reduce in the attainment plan, subject to EPA approval. Pollutants that are not subject to control measures in the attainment plan, either because of insignificant benefits in reducing ambient PM<sub>2.5</sub> concentrations or because of availability or feasibility of control, are not included in the RFP benchmark for 2008 RFP plan purposes.

EPA proposes that States should define RFP benchmark emission reduction levels in each area to reflect generally linear progress toward attainment. Consider an example for a particular area in which the State proposes an April 2013 attainment date and thus would need to achieve attainment level emissions in 2012. If the attainment plan calls for a 20 percent reduction in SO<sub>2</sub> emissions from 2002 levels and a 10 percent reduction in PM<sub>2.5</sub> direct emissions, then the RFP benchmark for SO<sub>2</sub> would reflect roughly a 2 percent reduction in SO<sub>2</sub> emissions per year, and the benchmark level for PM<sub>2.5</sub> would be roughly a 1 percent reduction per year. The 2010 milestones in this example would be about a 14 percent reduction in annual SO<sub>2</sub> emissions and a 7 percent reduction in PM<sub>2.5</sub> direct emissions to be achieved during 2009 (the emissions

year prior to the January 1, 2010 milestone date).

EPA proposes that States must provide 2010 RFP milestones that provide air quality improvement equivalent to this RFP benchmark. The next subsection describes the process EPA is proposing to use to assess whether alternative timetables for controlling various pollutants are equivalent.

iii. How should States assess the equivalence of alternative combinations of pollutant emissions reductions?

EPA proposes to judge an alternative combination of pollutant emissions reductions as being at least equivalent to the RFP benchmark (e.g., emissions reductions to be achieved from 2002 to the January 1, 2010 milestone) if the State makes an adequate showing that the alternative will provide estimated air quality improvements that are roughly the same as those that the benchmark emission reductions would provide. If the State elects to follow this approach, it must provide in its 2008 RFP plan the information necessary to assess whether an alternative set of emissions reductions is generally equivalent to the RFP benchmark reduction levels. The attainment plan will define a set of emissions reductions and analyze the corresponding expected air quality improvements. For example, attainment plans that include reductions in SO<sub>2</sub> emissions will include modeling and an attainment demonstration which assess the corresponding reduction in sulfate concentrations. States should use this information to evaluate the equivalence of alternative combinations of pollutant emissions reductions.

EPA recommends that States estimate air quality improvements associated with intermediate emission control levels by assuming that the same relationship between emissions and air quality applies at intermediate levels as would apply at attainment plan levels. For the purpose of developing their 2010 RFP milestones, States should assume that by January 1, 2010, a given fraction of the emissions reductions in the attainment plan (i.e. the fraction being the percent of reductions to be achieved by the 2010 milestone) will achieve the same fraction of the associated air quality benefits in the attainment plan. An example in the next section further explains this point.

EPA recognizes that because atmospheric processes are quite complex, a specific percent change in emissions typically does not lead to an equivalent percent change in air quality. This non-linear relationship introduces

uncertainties as to whether alternate RFP plans will in fact achieve equivalent benefits. Nevertheless, EPA believes that it is important to provide the flexibility to address different pollutants on different timetables so long as the plan can reasonably be expected to achieve the intended air quality benefits at the RFP benchmark level. In general, EPA does not intend to require dispersion modeling specifically to assess whether an alternative approach to meeting RFP provides equivalent air quality benefits as the benchmark definition. The attainment plan modeling addresses the nonlinearities at attainment levels, and EPA believes for RFP plan purposes that the relationship between emissions and air quality at attainment levels provides an adequate approximation of the relationship at RFP levels.

EPA anticipates that RFP plans will generally only control pollutants that are also controlled in the attainment plan. Therefore, EPA expects the attainment plan to include information on the emissions-air quality relationship for all pollutants included in the RFP plan. If a case arises where the RFP plan reduces emissions for a pollutant that is not reduced in the attainment plan, the State may need to conduct additional modeling to assess the air quality benefit of the relevant component of the RFP plan to support its demonstration of equivalence with the RFP benchmark.

iv. How would RFP be evaluated for a sample 2008 RFP plan?

As an example, suppose that the attainment plan for "Kleenare City" projects that the area will attain the standards with a 20 percent reduction in SO<sub>2</sub> emissions, 20 percent reduction in nitrogen oxide emissions, and a 10 percent reduction in direct PM<sub>2.5</sub> emissions. (For the purpose of simplifying this example, assume that direct PM<sub>2.5</sub> emissions are principally comprised of organic and elemental carbon.) The area's plan projects that, consistent with the requirement to attain as expeditiously as practicable, the area would attain by April 2013 based on reductions achieved during 2012. Under EPA's proposal, the RFP benchmark levels should reflect roughly 1/10 of the emission reduction for each pollutant each year. Thus, for the ten year period from 2002–2012, this roughly equates to a 2.0 percent annual reduction in SO<sub>2</sub> emissions, 2.0 percent annual reduction in nitrogen oxide emissions, and 1.0 percent annual reduction in direct PM<sub>2.5</sub> (carbon) emissions per year. The January 1, 2010 milestones should then include 7/10 of the progress from 2002 conditions

through 2009 (the emissions year prior to the milestone). Thus, the 2010 RFP benchmark would have emission levels reflecting a 14 percent reduction of SO<sub>2</sub> emissions, a 14 percent reduction of nitrogen oxide emissions, and a 7 percent reduction of direct PM<sub>2.5</sub> (carbon) emissions.

Unless the State sets RFP emission reduction milestones for 2010 identical to (or greater than) the RFP benchmark, the next step is to assess the air quality improvement estimated for the RFP benchmark and the air quality improvement estimated for the State's alternative milestones. Both assessments would rely on the relationship between emissions reductions and air quality improvement for the various pollutants addressed in the attainment plan.

This example assumes that Kleenare City has the concentrations of PM<sub>2.5</sub> constituents described in the above example, the attainment plan described in the paragraph above, and the expectation of achieving attainment level emissions by 2012 (i.e., a 2013 attainment deadline). Thus, the design value for the area is 17.0 µg/m<sup>3</sup>, consisting of 7.0 µg/m<sup>3</sup> of ammonium sulfate, 6.0 µg/m<sup>3</sup> of carbonaceous PM (e.g. organic and elemental carbon), and 4.0 µg/m<sup>3</sup> of ammonium nitrate. Assume further that the attainment plan as described just above demonstrates relative reduction factors which indicate the following impacts: The 20 percent SO<sub>2</sub> emission reduction is expected to reduce ammonium sulfate concentrations by 1.2 µg/m<sup>3</sup>; the 10 percent reduction in direct PM<sub>2.5</sub> emissions is expected to reduce direct PM<sub>2.5</sub> concentrations (assume this component is primarily organic and elemental carbon) by 0.4 µg/m<sup>3</sup>; and the 20 percent NO<sub>x</sub> emission reduction is expected to reduce nitrate concentrations by 0.6 µg/m<sup>3</sup>.

As calculated above, the RFP benchmark levels for 2010 would include 7/10 of the emissions reductions planned through 2012, which would be expected to achieve at least 7/10 of the associated air quality improvement expected in the attainment plan. Thus, the 2010 RFP benchmark levels would be expected to reflect the following estimated air quality improvement: the 20 percent SO<sub>2</sub> emission reduction would yield an estimated [1.2 \* (14 percent / 20 percent)] or 0.84 µg/m<sup>3</sup> ammonium sulfate reduction, the 8 percent direct PM<sub>2.5</sub> (carbon) emission reduction would yield an estimated [0.4 \* (7 percent / 10 percent)] or 0.28 µg/m<sup>3</sup> carbon particle reduction, and the 20 percent NO<sub>x</sub> emission reduction would yield an estimated [0.6 \* (14 percent / 20 percent)] or 0.42 µg/m<sup>3</sup> ammonium

nitrate reduction. The total air quality improvement of this 2010 benchmark plan would be estimated as (0.84 + 0.28 + 0.42), or 1.54 µg/m<sup>3</sup>. Thus, for this example, the target air quality level for the 2007–9 period would be approximately 15.5 µg/m<sup>3</sup> (17.0 – 1.54 = 15.46).

Now suppose that the State is considering phasing in emission reduction strategies such that by the 2010 milestone date, SO<sub>2</sub> emissions would be reduced by only 10 percent, direct organic and elemental carbon particle emissions would be reduced by the full 10 percent (as included in the attainment plan), and NO<sub>x</sub> emissions would be reduced by the full 20 percent. This alternative would be estimated to achieve air quality improvement that includes [1.2 \* (10 percent / 20 percent)] or 0.6 µg/m<sup>3</sup> ammonium sulfate reduction, [0.4 \* (10 percent / 10 percent)] or 0.4 µg/m<sup>3</sup> carbon particle reduction, and [0.6 \* (20 percent / 20 percent)] or 0.6 µg/m<sup>3</sup> ammonium nitrate reduction. The total air quality improvement of this 2010 milestone alternative would be estimated to be (0.6 + 0.4 + 0.6) or 1.6 µg/m<sup>3</sup> reduction in PM<sub>2.5</sub> concentrations. Since this estimated air quality improvement exceeds the improvement estimated for the 2010 RFP benchmark level, EPA would judge this set of milestones to be considered equivalent to the 2010 RFP benchmark levels.

v. What potential RFP requirements could apply for "serious" areas under the two-tiered classification option?

As described in section III.A. on classification options, a serious area would be one that could adequately demonstrate that attainment of the standards "as expeditiously as practicable" would not be within the first five years after designation, and therefore would receive an attainment date extension of 1 to 5 years. Under the two-tiered classification option, a serious area would be subject to more stringent requirements in return for the attainment date extension. The classifications section III.A. takes comment on possible "more stringent" requirements for serious areas, including prescriptive RFP requirements and/or lower thresholds for RACT review (under one RACT option presented in section III.I.5 of this package).

One possible RFP approach contemplated in the classifications discussion is a fixed percentage reduction of the emissions of direct PM<sub>2.5</sub> and regulated PM<sub>2.5</sub> precursors to be achieved in specified milestone years between the 2002 base year and the

attainment year proposed in the attainment demonstration. This approach would be patterned after the rate of progress requirement in section 182 for ozone, which requires a 3 percent per year average emission reduction of VOC for certain areas, with emission reduction targets to be met every three years (*i.e.*, a 9 percent reduction over three years). The EPA could formulate this alternative either with the same 3 percent average annual emission reduction as specified in section 182 or with some other more appropriate percentage. Use of a fixed percentage reduction target would be consistent with the congressional intent behind the section 182 requirement to require additional emission reduction actions in areas with more serious air quality problems.

This approach could require a strict percentage reduction of each pollutant, or it could allow the States flexibility to employ a different mix of pollutant reduction percentages in order to achieve an equivalent air quality improvement as would be achieved under the fixed percentage approach. Section III.G.5.b.iii. above provides guidance on how to demonstrate equivalency in this type of situation.

Under this option, RFP plans would be submitted in April 2008 along with attainment plans. RFP milestones would be established for 2010 and, in the case of areas with later attainment dates, 2013. The application of the percent reduction concept is relatively straight forward. For example, under a 3 percent per year RFP emission reduction requirement for an area with an attainment date extension to 2015, the area's 2010 emission reduction milestone would reflect a 21% reduction (*i.e.* 3% per year  $\times$  7 years from 2002 through 2009) in emissions of regulated PM<sub>2.5</sub> pollutants. For a 2013 milestone (*e.g.* reductions through 2012), a 30% emission reduction would be required (3% per year  $\times$  10 years from 2002 to 2012). The requirement for RFP between 2013 and the attainment date would be satisfied by the reductions needed for attainment.

As with the basic RFP approach proposed above, all emissions reductions since 2002 from federal, regional, state and local measures would be creditable toward meeting the RFP targets. These would include, for example, substantial reductions from CAIR, federal motor vehicle emissions standards and other federal rules. Overall, we believe there would be merit in establishing a more stringent RFP requirement under any option for serious areas. An advantage of the fixed percentage approach may be that it

would be easier to implement and communicate to the public. EPA requests comment on the use of a fixed percentage requirement for serious areas and on what is an appropriate annual percentage reduction rate for PM<sub>2.5</sub> and associated precursors.

#### 5. Other RFP Issues

##### a. How should States account for regional control strategies in evaluating RFP?

States should consider all adopted, enforceable control programs in evaluating whether RFP is being achieved, including national measures, regional measures, and local measures. National programs established by EPA include the Clean Air Interstate Rule addressing SO<sub>2</sub> and NO<sub>x</sub> emissions in the eastern U.S., eastern NO<sub>x</sub> reductions from power plants and other sources to address the ozone standards (the "NO<sub>x</sub> SIP call"), and a variety of motor vehicle limitations, including the phase-in of emission limits as new vehicles replace older vehicles through fleet turnover. More recent mobile source rules include limits for new heavy-duty diesel engines starting in 2004, considerably more stringent diesel engine limits starting in 2007, emission limits for new gasoline vehicles ("Tier II") starting in 2004, limits on the sulfur content of gasoline and diesel starting in 2004 and 2006, respectively, and limits on nonroad vehicle emissions. Expressed more generally, States should base the evaluation of RFP simply on the enforceable emissions for the area, regardless of what mix of adopted control programs and other influences lead to the applicable emissions level.

The guidance for PM<sub>2.5</sub> differs somewhat in this respect from the guidance for ozone. For ozone, CAA section 182(b)(1)(D) specifies several types of measures that may not be credited toward achievement of the ozone rate of progress requirements. These restrictions are only mandated by the statute with respect to pre-1990 controls for ozone. The Act does not provide any such requirement with respect to controls for PM.

##### b. What geographic area should States address in RFP plans?

Another important issue is the geographic area to be addressed in the RFP plan. As discussed above, EPA believes the CAA RFP provision requires emissions reductions that will provide steady improvement in air quality in the nonattainment area prior to its attainment date. This suggests that RFP requirements should apply within a geographic area from which emissions

substantially affect air quality in the nonattainment area. This geographic area may differ for different pollutants that contribute to PM<sub>2.5</sub> levels. The EPA also envisions approaching this issue differently for the reasons described below.

EPA proposes an approach based on EPA's views of the typical emissions area that most strongly correlates with associated components of urban PM<sub>2.5</sub> concentrations. Since different prospective nonattainment areas have different types of PM<sub>2.5</sub> problems, some areas may warrant use of different geographic areas from the defaults presented here. For example, a mountain valley area in which concentrations are dominated by local emissions regularly trapped in inversions should address all pollutants on a nonattainment area basis and not on a statewide basis.

EPA is proposing default areas of consideration for emissions of direct PM<sub>2.5</sub>, NO<sub>x</sub>, and SO<sub>2</sub>. For direct PM<sub>2.5</sub> emissions, including emissions of elemental carbon, organic particles and inorganic particles such as metals and crustal material, emissions from within the nonattainment area should be considered for tracking compliance with RFP milestones. Particles that originate from direct PM<sub>2.5</sub> emissions tend to be dominated by nearby emissions. While the greatest impact at a monitoring location may arise from sources within a few kilometers, a nonattainment area-wide approach assures that the entire area is achieving RFP. A nonattainment area-wide approach also will generally be easier to administer in conjunction with other requirements such as RACT and RACM. EPA does not believe that direct PM<sub>2.5</sub> emissions from sources outside the nonattainment area should be considered for RFP purposes.

The proposed approach for considering NO<sub>x</sub> and SO<sub>2</sub> emissions for RFP under the PM<sub>2.5</sub> program is similar to the approach for addressing NO<sub>x</sub> emissions in past guidance for 1-hour ozone rate of progress plans.<sup>62</sup> The ozone guidance provides that in their RFP baseline inventories, States at a minimum are required to include all

<sup>62</sup> Memorandum of December 29, 1997 from Richard D. Wilson to Regional Administrators, Regions I-X re "Guidance for Implementing the 1-Hour Ozone and Pre-Existing PM<sub>10</sub> NAAQS." Located at URL: <http://www.epa.gov/ttn/oarpg/t1/memoranda/iig.pdf>. This policy recognized that VOC emissions up to 100 km and NO<sub>x</sub> emissions up to 200 km from the nonattainment area could be relied on for RFP. The specified distances resulted from discussions of the FACA Subcommittee on Ozone, PM, and Regional Haze Implementation Programs. Because some stakeholders have expressed concerns about this policy, EPA is in the process of subjecting this policy to a technical review and may revise it in light of that review.



sources of NO<sub>x</sub> and VOC emissions from within the nonattainment area. The ozone guidance also provides that States may include in RFP plans certain NO<sub>x</sub> sources located up to 200 kilometers outside of an ozone nonattainment area and certain VOC sources located 100 kilometers outside of an ozone nonattainment area and take credit for emission reductions from these sources for RFP purposes. EPA believes that for the PM<sub>2.5</sub> program, it would be appropriate to allow for the possibility of crediting SO<sub>2</sub> and NO<sub>x</sub> reductions outside the nonattainment area because numerous technical studies have generally demonstrated the long-range transport of sulfates and nitrates. (See section II on the technical characterization of PM<sub>2.5</sub>.) As with ozone, EPA believes that ambient particle concentrations reflect a combination of effects from local as well as regional NO<sub>x</sub> and SO<sub>2</sub> emissions, justifying an approach that focuses on nonattainment area NO<sub>x</sub> and SO<sub>2</sub> emissions but also gives incentive for reductions outside the nonattainment area.

However, because of various concerns expressed about such a policy for RFP purposes, any State proposing to take credit for reductions by any NO<sub>x</sub> or SO<sub>2</sub> source located within 200 kilometers of the nonattainment area will need to include with its SIP submittal appropriate documentation demonstrating that emissions from the sources outside the nonattainment area contribute to fine particle concentrations within the nonattainment area. Because of the uncertainty associated with VOC contributions to PM<sub>2.5</sub> concentrations, we do not believe it would be appropriate to extend the policy to VOC sources located 100 kilometers outside of a PM<sub>2.5</sub> nonattainment area. If the State or EPA finds that VOC are a significant contributor to an area's PM<sub>2.5</sub> problem, RFP credit for VOC will be granted for reductions achieved within the nonattainment area only.

As discussed earlier, the RFP plan should include a motor vehicle emissions budget for each milestone year. Because the transportation conformity program applies only within the nonattainment area, the RFP plan cannot take credit for motor vehicle direct PM<sub>2.5</sub> and applicable PM<sub>2.5</sub> precursor emissions reductions achieved outside of the nonattainment area. (See section III.K. for further discussion of transportation conformity issues.)

The EPA expects that analyses conducted as part of the attainment demonstration will help identify the

most appropriate geographic range of interest for each pollutant. EPA believes that if an area concludes that controls for a specific pollutant on an alternate geographic scale are more appropriate for reaching attainment, the area should use that same alternate geographic scale in assessing RFP. In particular, for each pollutant addressed, the same geographic scale must be used in analyzing the 2002 inventory, the attainment year inventory, and any RFP milestone year inventories, in order to assure that the milestones in fact represent RFP on a path to timely attainment.

EPA solicits comments on other alternatives for the geographic coverage of NO<sub>x</sub> and SO<sub>2</sub> inventories. The principal alternatives of interest are to be either more or less inclusive. EPA takes comment on (1) an approach that would allow the State to include a broader set of sources<sup>63</sup> located within 200 kilometers of the nonattainment area, and (2) an approach including all nonattainment area sources but no additional sources outside the nonattainment area.

c. How should RFP be addressed in multi-state nonattainment areas?

In general, EPA seeks to ensure that nonattainment areas that include more than one State meet RFP requirements as a whole. States that share a nonattainment area should consult to assure that the collective set of emission reduction milestones provide for adequate emissions reductions to represent RFP for the area as a whole. The States should work with the EPA region or regions that oversee the SIPs for those States to confirm that their collective approach is acceptable for RFP.

d. How should States compile emission inventories for RFP plans?

In general, States should prepare emission inventories for RFP plans according to the same guidance that applies to emission inventories for attainment plans. Similar guidance on assessment of allowable emissions resulting from a new emission limit applies in both cases. Emission inventories for RFP plans should be adequate to track progress in meeting the annual standard in all areas. States should also develop inventories adequate to ensure progress in meeting the 24-hour standard for those areas that

violate or are close to violating this standard.

e. What RFP requirements apply in Tribal areas?

Under the Tribal Authority Rule (40 CFR 49.4), EPA found that it was not appropriate to treat Tribes in a manner similar to a State with regard to SIP schedules. This flexibility extends to submittal of plans for the RFP requirement. Because there are typically limited emissions in Tribal areas, this flexibility on RFP should not have significant impact on surrounding jurisdictions in most instances. However, the TAR also acknowledges that where the Tribes are unable to meet the requirements of the CAA, EPA will implement the program where it is "necessary and appropriate". Therefore, in the event that flexibility in the RFP deadline for Tribes jeopardizes RFP in surrounding jurisdictions, EPA will work with the Tribes to ensure that emissions on Tribal lands are appropriately addressed.

EPA guidance for nonattainment areas that include both State and Tribal lands is similar to guidance for multi-State nonattainment areas. States and Tribes that share a nonattainment area should consult to assure that the collective set of emission reduction milestones for the nonattainment area as a whole satisfy the requirements described above and thus provide for the steady air quality improvement intended under the CAA.

f. What must States submit to show whether they have met RFP milestones?

The establishment of milestones implies subsequent reporting demonstrating whether these milestones have been met. For example, the establishment in a 2008 RFP plan of milestones reflecting 2009 emissions implies reporting in 2010 whether these milestones were met. However, emissions for a given year are commonly not known until well after the year has ended. The EPA is evaluating alternative approaches to this issue and plans to issue guidance on this issue at a later date.

*H. What requirements for contingency measures should apply under the PM<sub>2.5</sub> implementation program?*

For PM<sub>2.5</sub>, under Subpart I of the CAA, all nonattainment areas must include in their SIPs contingency measures consistent with section 172(c)(9). Contingency measures are additional control measures to be implemented in the event that an area fails to meet RFP or fails to attain the standards by its attainment date. These contingency measures must be fully

<sup>63</sup> Under this option, sources outside the nonattainment area would exclude on-road sources since under the transportation conformity program, motor vehicle emissions budgets apply only within the nonattainment area.

adopted rules or control measures that are ready to be implemented quickly upon failure to meet RFP or failure of the area to meet the standard by its attainment date. The SIP should contain trigger mechanisms for the contingency measures, specify a schedule for implementation, and indicate that the measures will be implemented without significant further action by the State or EPA. The contingency measures should consist of other control measures for the area that are not included in the control strategy for the SIP.

The April 16, 1992 General Preamble provided the following guidance:

“States must show that their contingency measures can be implemented with minimal further action on their part and with no additional rulemaking actions such as public hearings or legislative review. In general, EPA will expect all actions needed to affect full implementation of the measures to occur within 60 days after EPA notifies the State of its failure.” (57 FR at 13512.) This could include Federal measures and local measures already scheduled for implementation.

The EPA has approved numerous SIPs under this interpretation—i.e., that use as contingency measures one or more Federal or local measures that are in place and provide reductions that are in excess of the reductions required by the attainment demonstration or RFP plan. (62 FR 15844, April 3, 1997; 62 FR 66279, December 18, 1997; 66 FR 30811, June 8, 2001; 66 FR 586 and 66 FR 634, January 3, 2001.) The key is that the statute requires extra reductions that are not relied on for RFP or attainment and that are in the demonstration in order to provide a cushion while the plan is revised to meet the missed milestone. In other words, contingency measures are intended to achieve reductions over and beyond those relied on in the attainment and RFP demonstrations. Nothing in the statute precludes a State from implementing such measures before they are triggered. In fact, a recent court ruling upheld contingency measures that were previously required and implemented where they were in excess of the attainment demonstration and RFP SIP. *See LEAN v. EPA*, 382 F.3d 575 5th Circuit, 2004.

One basis EPA recommends for determining the level of reductions associated with contingency measures is the amount of actual PM<sub>2.5</sub> emissions reductions required by the control strategy for the SIP to attain the standards. The contingency measures are to be implemented in the event that the area does not meet RFP, or attain the standards by the attainment date, and

should represent a portion of the actual emissions reductions necessary to bring about attainment in area. Therefore, the emissions reductions anticipated by the contingency measures should be equal to approximately one year’s worth of emissions reductions necessary to achieve RFP for the area (See section III.G. for more detail on RFP requirements.)

As stated previously, EPA believes that contingency measures should consist of other available control measures beyond those required to attain the standards, and may go beyond those measures considered to be RACM for the area. It is, however, important that States make decisions concerning contingency measures in conjunction with their determination of RACM for the area, and that all available measures needed in order to demonstrate attainment of the standards must be considered first; all remaining measures should then be considered as candidates for contingency measures. It is important not to allow contingency measures to counteract the development of an adequate control strategy demonstration.

Contingency measures must also be implemented immediately after EPA determines that the area has either failed to meet RFP, or attain the standard by its attainment date. The purpose of the contingency measure provision is to ensure that corrective measures are put in place automatically at the time that EPA makes its determination that an area has either failed to meet RFP or failed to meet the standard by its attainment date. The EPA is required to determine within 90 days after receiving a State’s RFP demonstration, and within 6 months after the attainment date for an area, whether these requirements have been met. The consequences for states which fail to attain or to meet RFP are described in section 179 of the Act.

#### *I. What requirements should apply for RACM and RACT for PM<sub>2.5</sub> nonattainment areas?*

##### 1. General Background

Subpart 1 of section 172 of the Act includes general requirements for all designated nonattainment areas. Section 172(c)(1) requires that each nonattainment area plan “provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology), and shall provide

for attainment of the national primary ambient air quality standards.” States are required to implement RACM and RACT in order to attain the standards “as expeditiously as practicable.”<sup>64</sup> A RACM demonstration should show that there are no additional reasonable measures available that would advance the attainment date by at least one year or contribute to RFP for the area.<sup>65</sup>

This section first discusses issues associated with RACT, traditionally considered to be an independent stationary source control requirement, and then addresses issues associated with RACM.

##### 2. Background for RACT

EPA’s historic definition of RACT has been the lowest emissions limitation that a particular source is capable of meeting by the application of control technology that is reasonably available, considering technological and economic feasibility. Because RACT is a control technology requirement and modeling techniques were not precise in the past, RACT has been considered to be independent of the need to demonstrate attainment.

Section 172 (subpart 1) does not include specific applicability thresholds for the size of sources that should be the minimum starting point for RACT analysis, as are provided in subpart 2 (ranging from 100 to 10 tons per year for ozone, depending on the level of nonattainment) or subpart 4 (either 100 or 70 tons per year for PM<sub>10</sub> depending on the level of nonattainment). Subpart 1 also does not include a specific list of stationary source categories for which control techniques guidelines are to be developed. For PM<sub>10</sub>, the Act provided particular emphasis for specific sources of area emissions, but did not highlight specific stationary sources for the purposes of RACT. (Section 190 of the Act required EPA to develop RACM guidance documents for residential wood combustion, prescribed burning for forest management and agricultural activities, and for urban fugitive dust control.) Under subpart 2 for ozone, EPA has more specifically identified RACT for certain source categories through issuance of a number of control techniques guidelines (CTGs) and

<sup>64</sup> Under the TAR, requirements for RACT and RACM may be considered to be severable elements of implementation plan requirements for Tribes.

<sup>65</sup> In the context of the PM<sub>10</sub> NAAQS, EPA has concluded, based upon the annual form of the standard, that “advancement of the attainment date” should mean an advancement of at least one calendar year. See: State Implementation Plans; General Preamble for the Implementation of Title I of the CAA Amendments of 1990; Proposed Rule.” April 16, 1992 (57 FR 13498). See also *Sierra Club v. EPA*, 294 F.3d 155 (DC Cir. 2002).

alternative control techniques (ACTs) documents.

### 3. Emissions Inventory Analysis Supporting RACT Options

As supporting information for developing options for RACT for PM<sub>2.5</sub>, we have reviewed the 2001 National Emissions Inventory to examine both the size range of stationary sources and the types of sources that emit PM<sub>2.5</sub> and its precursors. Because the statutory requirements for both PM<sub>10</sub> and ozone are such that the RACT applicability threshold cannot be higher than a potential to emit 100 tons per year, we began our analysis by evaluating the national emissions inventory to identify sources of PM<sub>2.5</sub> or any precursor which exceeded this threshold. Because information in the national emission inventory is expressed in terms of actual emissions rather than "potential" emissions, we used actual emissions information in this analysis as a surrogate for potential emissions thresholds.

Our analysis of the national emissions inventory indicates that the mix of source categories responsible for PM<sub>2.5</sub> and precursor emissions in potential PM<sub>2.5</sub> nonattainment areas varies greatly. Contributing sources include stationary sources such as electricity generating units, industrial boilers, and oil refineries, as well as smaller mobile and area sources, such as diesel engines, solvent usage, and various types of burning activities.

The analysis of point source emissions for stationary sources located in PM<sub>2.5</sub> nonattainment areas shows that for each of the five main pollutants associated with PM<sub>2.5</sub> (direct PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, VOC, and ammonia), individual facilities with actual emissions greater than 100 tons per year of one of these pollutants account for a significant amount of the total emissions for all facilities in these areas. When the potential 70 and 50 ton per year thresholds are compared to the 100 ton per year threshold, the additional emissions coverage increases by 2 percent or less for PM<sub>2.5</sub>, NO<sub>x</sub>, SO<sub>2</sub>, and ammonia. For VOC, the emissions coverage increases modestly, by about 9 percent.

In contrast, the number of facilities potentially covered at the 70 and 50 ton thresholds increase more significantly. When the number of facilities exceeding the 100 ton threshold for each pollutant is compared to the number of facilities exceeding the 70 ton threshold, the numbers of facilities increase from 10 percent (ammonia) to 44 percent (VOC). When the number of facilities exceeding the 100 ton threshold for each pollutant

is compared to the number of facilities exceeding the 50 ton threshold, the numbers of facilities increase by 24 percent (SO<sub>2</sub>) to 90 percent (VOC).

### 4. Which PM<sub>2.5</sub> precursors must be addressed by States in establishing RACT requirements?

As discussed earlier in this section on RACT and RACM and in the technical overview section, the precursors of PM<sub>2.5</sub> are SO<sub>2</sub>, NO<sub>x</sub>, VOC, and ammonia. In section II.E., we discuss options for addressing these precursors under the PM implementation program. The EPA will finalize its precursor policy for PM implementation after considering public comment received on this proposal.

### 5. What are the proposed options for implementing the RACT requirement?

This section describes the approaches EPA is considering for implementation of the RACT requirement of section 172(c)(1), to insure that States consider and adopt RACT measures for stationary sources in a way that is consistent with the overarching requirement to attain the standards as expeditiously as practicable, yet provides flexibility for States to focus regulatory resources on those sources of emissions that contribute most to local PM<sub>2.5</sub> nonattainment. The RACT requirement will apply both to sources of direct PM<sub>2.5</sub> emissions and to sources of PM<sub>2.5</sub> precursors in the given nonattainment area. The EPA will require States to demonstrate that they have adopted all appropriate RACT measures in the attainment demonstrations that States must submit to EPA in early 2008.

EPA is proposing three basic approaches to implementing the RACT requirement. The first alternative would simply require States to conduct a RACT analysis and require reasonably available controls for all affected stationary sources in the nonattainment area, comparable to the implementation of RACT provided in subpart 4 governing implementation of the PM<sub>10</sub> NAAQS and subpart 2 governing implementation of the 1-hour ozone NAAQS. Under this alternative for RACT, EPA is also proposing to limit the universe of sources for which States must conduct a RACT analysis and impose RACT controls, based upon the amount of emissions potentially emitted by the sources. (See discussion later in this section on potential emissions thresholds applicable under the first alternative.) The second alternative would likewise require States to conduct a RACT analysis and require reasonably available controls on stationary sources, but would allow

States to decline to impose controls that would not otherwise be necessary to meet RFP requirements or to attain the PM<sub>2.5</sub> NAAQS as expeditiously as practicable.<sup>66</sup>

The third alternative would be a combination of the first two and is consistent with the RACT approach adopted in the final implementation rule for the 8-hour ozone program. It would require States to conduct a RACT analysis and require reasonably available controls for all affected stationary sources in the nonattainment area only for areas with attainment dates more than five years from the date of designation. For areas with an attainment date within five years of designation (e.g. by April 2010 for areas designated in late 2004), RACT would be required as under the second alternative, in which States could decline to impose controls that would not otherwise be necessary to meet RFP requirements or to attain the PM<sub>2.5</sub> NAAQS as expeditiously as practicable. The EPA seeks comment on the three alternative approaches for RACT discussed below, and on the options presented for a RACT source emissions threshold applicable under the first and third options.

First proposed alternative for RACT. Under the first alternative, EPA would require States to conduct RACT determinations and require RACT controls for all stationary sources located in nonattainment areas, subject to any size threshold as discussed in the options below. In this approach, covered sources would be required to apply technically and economically feasible controls and there would be no opportunity for States to excuse major stationary sources from control on the basis that the emissions reductions from those controls would not be necessary for RFP or to expedite attainment. The EPA believes that this first alternative would be consistent with the approach set forth in the CAA in subpart 4 governing PM<sub>10</sub> nonattainment areas and in subpart 2 governing 1-hour ozone nonattainment areas wherein all stationary sources with at least a given amount of potential annual emissions are subject to RACT controls. The logic behind requiring RACT for all such sources in subpart 2 and subpart 4 was presumably that large stationary sources are a significant source of emissions in nonattainment areas and that States

<sup>66</sup> Note that States are required to implement RACT only within the nonattainment area while it is proposed elsewhere in today's proposal that States may use reductions from selected sources outside the nonattainment area to meet RFP milestones.

necessarily need to control them as part of an effective SIP.

EPA believes that requiring RACT for all large sources may also be appropriate for implementation of the RACT requirement for PM<sub>2.5</sub> for a number of reasons. First, as with ozone problem areas, sources located across a broad region appear to contribute to PM<sub>2.5</sub> nonattainment problems. As such, implementing the RACT requirement for all major sources located in nonattainment areas will “level the playing field” from one area to another. Controls on sources subject to RACT will improve air quality in the nonattainment area in which the facility is located, and in many cases will also improve air quality in nearby nonattainment areas.

Second, like ozone and to a lesser extent PM<sub>10</sub>, PM<sub>2.5</sub> nonattainment in many areas appears to be largely a product of secondarily formed particles that result from emissions of precursors that react in the atmosphere. While we understand the basic processes and mechanisms that cause PM<sub>2.5</sub> formation, we likewise recognize that sorting out the various sources and their impacts on local and regional nonattainment is a difficult and resource intensive process, subject to some uncertainty. Requiring RACT controls for all large stationary sources under subpart 2 (for ozone) and subpart 4 (for PM<sub>10</sub>) greatly simplified the SIP development process by requiring the analysis for and imposition of RACT controls for these sources, and thereby foreclosed the need to divert State resources to demonstrate conclusively the need for RACT controls for large stationary sources or to explore plan options that would permit excusing certain sources from control, perhaps at the cost of regulating other smaller sources less central to the nonattainment problem.

Third, EPA notes that the rule to implement the new 8-hour ozone NAAQS also sought comment on an option that would require RACT for all large stationary sources in subpart 1 areas with design values greater than 91 parts per billion (ppb). Given that some of the PM<sub>2.5</sub> and 8-hour ozone nonattainment areas will overlap and that PM and ozone have common precursors, EPA anticipates that many of the same large stationary sources will be subject to RACT in connection with the ozone NAAQS in any case. Thus, requiring RACT on all large sources will also “level the playing field” among sources located in ozone or PM<sub>2.5</sub> nonattainment areas, and will help to alleviate unintended consequences of an inconsistent approach.

Notwithstanding the practical and policy arguments in favor of requiring RACT for all large stationary sources, EPA recognizes that in other contexts concerning other NAAQS, RACT has been interpreted alternatively as a component of the general RACM requirement in section 172(c)(1). Nevertheless, EPA believes that the health impacts of PM<sub>2.5</sub> nonattainment and the similarities between the PM<sub>2.5</sub>, PM<sub>10</sub>, and ozone problems (e.g., cause by many and various sources, regional in nature) may justify consideration of a comparable RACT approach. The EPA specifically solicits comment on this alternative in which RACT is required for all large sources above a particular tonnage threshold, without regard to RFP or attainment needs.

Options for a RACT emissions threshold under the first proposed alternative. Under the first proposed alternative in which States are required to impose RACT controls on stationary sources, EPA recognizes that it may not be reasonable for States to require RACT controls regardless of the amount of the emissions from the individual sources in question. Section 172(c)(1) does not provide an explicit cutoff for the size of sources that States should subject to RACT controls, but there are such cutoffs elsewhere in the statute.

For example, in section 182(b)(2) governing nonattainment areas for the one-hour ozone NAAQS, the CAA requires RACT for those sources covered by preexisting control techniques guidelines or for other “major stationary sources,” *i.e.*, those sources with emissions above a specified number of tons per year, which varies depending upon the area’s nonattainment classification. In subpart 4 governing PM<sub>10</sub> nonattainment areas, section 189(b)(3) defines a “major source” as one stationary source (or a group of such sources contiguously located and under common control) that emits or has the potential to emit at least 70 tons of PM<sub>10</sub> per year, thereby altering the otherwise applicable 100 ton definition of major source in “moderate” PM<sub>10</sub> nonattainment areas and imposing greater control requirements on smaller sources in areas that are “serious” nonattainment for PM<sub>10</sub>. The logic behind such emissions thresholds is presumably that requiring RACT controls for small sources may not achieve the same degree of reductions that may be possible through focusing regulatory resources on relatively larger sources.

Given the significance of the health impacts that result from PM<sub>2.5</sub> nonattainment, EPA considered proposing that there should be no size

threshold for sources that States must address in a RACT analysis, thereby considering even small emissions sources for RACT controls and implementing those controls as appropriate. Ultimately, however, EPA has concluded that under the first proposed alternative for RACT, requiring RACT analyses for all stationary sources, regardless of the amount of annual potential emissions, may divert resources and attention from the necessary RACT analyses for larger, more significant sources of direct PM<sub>2.5</sub> and PM<sub>2.5</sub> precursors. Moreover, EPA expects States to consider controls for smaller stationary sources as part of the RACM analysis discussed below, so EPA does not anticipate that the creation of a RACT threshold based upon the amount of emissions will serve to exempt smaller stationary sources completely from all consideration of controls.

In short, EPA finds that under the first proposed alternative, it may not be reasonable to require RACT controls for all stationary sources regardless of size, and EPA is proposing to interpret section 172(c)(1) to allow EPA to define the universe of sources for which States should consider the need to impose RACT, based upon the potential annual emissions of the sources affected. For the first overall RACT alternative discussed above, EPA is proposing three sub-options for thresholds for implementing the RACT requirement that would limit the universe of sources for which States must conduct a RACT analysis, based upon the potential emissions from each source.

The first sub-option would require States to conduct RACT determinations, at a minimum, for all existing stationary sources<sup>67</sup> located in nonattainment areas and which have the potential to emit 100 tons per year or more of direct PM<sub>2.5</sub> or any individual precursor to PM<sub>2.5</sub>. (See the following subsection for a more detailed discussion of precursor emissions covered under RACT.) A source would be subject to this requirement if its plant-wide potential emissions exceeded the 100 ton threshold for PM<sub>2.5</sub> or any individual precursor in the baseline year of 2002 or later. We would require States to adopt RACT rules covering those sources above this threshold for which control

<sup>67</sup> A stationary source, as defined in various EPA regulations, is any building, structure, facility or installation which emits or may emit any pollutant regulated under the CAA, and for which all of the pollutant-emitting activities belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control).

measures are technically and economically feasible. As discussed in the previous section, the number of sources with emissions over 100 tons per year of direct PM<sub>2.5</sub> or any precursor pollutant make up a fairly small percentage of all stationary sources, but on a pollutant-by-pollutant basis, they are responsible for 70–90+ percent of the emissions in many nonattainment areas. Thus, this proposed approach to RACT would provide a mechanism by which States can address large emissions sources in all contributing source categories while evaluating a relatively small number of sources for consideration of RACT and implementation of RACT, as compared to the entire inventory of emissions sources.

Under the second proposed sub-option on emissions thresholds, we would require States to conduct RACT determinations for all existing stationary sources located in nonattainment areas which have potential emissions of 50 tons per year or more of direct PM<sub>2.5</sub> or any individual precursor to PM<sub>2.5</sub>. Under this option, States would conduct RACT determinations for a larger universe of stationary sources responsible for a larger fraction of direct PM<sub>2.5</sub> and precursor emissions. This sub-option would provide a lower threshold for RACT that would require States to address smaller sources and a broader range of sources under the RACT requirement.

As a third suboption for a RACT emissions threshold under the first alternative, EPA is considering creation of a scaled RACT threshold based upon the severity of pollution in the nonattainment area. Under this approach, most PM areas would have a 100-ton threshold, but areas with a more serious PM problem would have a 50-ton threshold. As a variation, another tier (e.g., 25 tons or 10 tons) could be created for areas with the highest PM levels.

The CAA imposes a tiered RACT approach for ozone in subpart 2, and EPA believes that the approach has been helpful to assure more expeditious attainment of the ozone NAAQS. The EPA has not yet determined what design values might be appropriate as cut points for lower thresholds, and we specifically request comments and supporting analyses on this issue, as well as on the overall approach in general.

Under all three sub-options for the RACT threshold, the specified potential-to-emit threshold would be the minimum starting point for RACT analyses. The EPA would not preclude a State from conducting an analysis to

assess the suitability of RACT controls for sources with emissions below the applicable threshold, particularly in areas having more serious air quality problems, in order to apply available control technology to those existing sources in the nonattainment area that are reasonable to control in light of the attainment needs of the area and the feasibility of installing such controls.<sup>68</sup> For example, States may find that selected source categories can apply controls cost-effectively at smaller sources than EPA's baseline applicability threshold.

Second proposed alternative for RACT. Under the second proposed alternative for RACT, EPA also would require States to conduct a RACT analysis and to require RACT for stationary sources, but would allow States to decline to impose controls that would otherwise be required as RACT if they are not necessary to meet RFP requirements or to attain the PM<sub>2.5</sub> NAAQS as expeditiously as practicable. In connection with other NAAQS, EPA has previously interpreted section 172(c)(1) to provide that a State must adopt at a minimum those RACT measures that are necessary for the nonattainment areas in that State to meet RFP requirements and to attain the standards as expeditiously as practicable. Under this second proposed alternative, the imposition of RACT controls on stationary sources would derive from the same statutory provision and impose the same requirement.<sup>69</sup> The EPA has also interpreted section 172(c)(1) to allow a State to decline to adopt certain technically and economically feasible measures, if adoption of those measures would not advance the attainment date by at least a year for the nonattainment area. Under this alternative interpretation, EPA would take the position that the RACT requirement for the PM<sub>2.5</sub> standards should be subject to that limitation as well.<sup>70</sup>

<sup>68</sup> This approach is consistent with EPA's historical RACT policy outlined in the 1992 general preamble (57 FR 13541).

<sup>69</sup> Subpart 1 of part D of the CAA includes the general provision that States must adopt plans for nonattainment areas which require implementation of RACT and RACT. The EPA has interpreted the provision to require States to include RACT and RACT measures to the extent that such measures will meet RFP requirements and will expedite attainment. In Subpart 2 specifically governing one-hour ozone nonattainment areas, however, the Act requires States to implement RACT on certain stationary sources independent of the emissions reductions needed to attain the applicable standard.

<sup>70</sup> A recent decision by the U.S. Court of Appeals for the District of Columbia has upheld this interpretation for RACT. The Court agreed with EPA's view that the statute does not require a State to adopt reasonably available control measures

In the context of the PM<sub>10</sub> NAAQS, EPA has concluded, based upon the annual form of the standard, that "advancement of the attainment date" should mean an advancement of at least one calendar year.<sup>71</sup> Similarly, given that the annual PM<sub>2.5</sub> standard is considered to be the "controlling" standard (as opposed to the 24-hour standard), and the fact that all sites violating the PM<sub>2.5</sub> standards are violating the annual standard rather than only the 24-hour standard, EPA believes that, under this option, advancement of the attainment date by at least one calendar year is likewise the proper test for assessing whether RACTM (including RACT under this option) would advance the attainment date for purposes of the PM<sub>2.5</sub> NAAQS.

EPA's second proposed RACT alternative, therefore, would require that all States must adopt such RACT measures for stationary sources as are necessary to meet RFP requirements and to attain the PM<sub>2.5</sub> standards as expeditiously as practicable. Under this approach, determination of RACT would be part of the broader RACTM analysis and identification of all measures—for stationary, mobile, and area sources—that are technically and economically feasible, and that would collectively contribute to advancing the attainment date. Because RACT and RACTM are considered together under this alternative, we are not proposing emissions threshold options for evaluation of stationary source RACT as are included under the first proposed alternative. In addition, under the second alternative, areas cannot avoid the imposition of either available RACT or RACTM measures without a demonstration showing that there is no combination of such declined RACT and RACTM measures that would advance the date of attainment by one year.

EPA presumes that many States with PM<sub>2.5</sub> nonattainment areas will conclude that RACT standards are necessary for many of the major stationary sources of emissions within the boundaries of such nonattainment areas in order to meet RFP and to expedite attainment of the standards. Nevertheless, there may be nonattainment areas in which a requirement for RACT controls on certain stationary sources would not

without regard to whether they would facilitate RFP or would expedite attainment. See *Sierra Club v. EPA*, 294 F.3d 155 (DC Cir. 2002).

<sup>71</sup> "State Implementation Plans; General Preamble for the Implementation of Title I of the CAA Amendments of 1990; Proposed Rule." April 16, 1992 (57 FR 13498). See also *Sierra Club v. EPA*, 294 F.3d 155 (DC Cir. 2002).

advance attainment by at least one year. For example, there may be nonattainment areas that are within a few tenths of a microgram of the standard and the State may determine that other local measures are adequate to bring the area into attainment as expeditiously as practicable, and that the absence of such controls will not significantly impact downwind States. In such areas, EPA believes that it might be reasonable to forego the requirement of RACT controls on certain stationary sources. Under this second alternative, each State would make that determination through its own fact specific RACT analysis in the attainment demonstration it submits to the Agency. EPA proposes that the RACT analysis under this option would not need to be a source-specific analysis, and instead could be conducted on a source-category basis. This alternative would provide greater flexibility for States to design local control programs for such areas.<sup>72</sup> EPA requests comment on all aspects of the second proposed option for RACT.

Third proposed alternative for RACT. The third proposed alternative for RACT would be a combination of the first two and is consistent with the RACT approach adopted in the final implementation rule for the 8-hour ozone program. Because of the importance EPA places on providing consistent policies between the ozone and PM<sub>2.5</sub> implementation programs, we propose this alternative as our preferred option.

The third proposed alternative would require States to conduct a RACT analysis and impose reasonably available controls for all affected stationary sources in the nonattainment area, only for those nonattainment areas with attainment dates more than five years from the date of designation. The same proposed suboptions with respect to the size of sources for consideration discussed under the first alternative would be included under this alternative as well.

For areas with an attainment date within five years of designation (e.g. by April 2010 for areas designated in late 2004), RACT would be required as described under the second alternative, in which States could decline to impose

controls that would not otherwise be necessary to meet RFP requirements or to attain the PM<sub>2.5</sub> NAAQS as expeditiously as practicable.

EPA believes that this alternative, which is in effect a "hybrid" of the first two, provides important policy advantages. First, it recognizes that certain areas are projected to attain the standards within five years of designations predominantly due to federal emission reduction programs. This alternative enables such areas to decline to impose controls on certain categories of sources if their implementation would not provide for an advancement of the attainment date. Second, it recognizes that those areas that need an attainment date extension due to more serious nonattainment problems should be required to impose RACT controls on affected sources in return for receiving the extension. This alternative is consistent with the overall approach taken in the 1990 Clean Air Act amendments, such as subpart 2 for ozone, under which areas with more severe air quality problems are required to implement a broader range of control requirements, in conjunction with attainment dates that are farther into the future. EPA requests comment on all three proposed RACT alternatives presented above.

Factors to consider in determining RACT. States should consider a number of factors in analyzing whether or not RACT controls will help a given area to meet RFP requirements or to attain the standard as expeditiously as practicable, and in determining what would constitute RACT for a given source category. First, our understanding of PM<sub>2.5</sub> formation indicates that ambient pollutant levels are the result of emissions from a large number of varied sources of direct PM<sub>2.5</sub> and PM<sub>2.5</sub> precursors. Accordingly, each State should examine closely the universe of emissions sources in each nonattainment area and evaluate carefully whether RACT controls are appropriate for some or all of these sources, given the specific nature of the nonattainment problem in such area. We anticipate that States may decide upon RACT controls that differ from State to State, but that are the most effective given the relevant mixture of sources and potential controls in the respective nonattainment areas. So long as each State can adequately demonstrate that its chosen RACT approach will provide for meeting RFP requirements and for attainment of the NAAQS as expeditiously as practicable, we anticipate approving plans that may elect to control a somewhat different mix of sources or to implement

somewhat different controls as RACT. Nevertheless, States should consider and address RACT measures developed for other areas or other States as part of a well reasoned RACT analysis. The EPA's own evaluation of State SIPs for compliance with the RACT and RACM requirements will include comparison of measures considered or adopted by other States.

Second, implementation of the PM<sub>2.5</sub> NAAQS is in its initial stages, and many of the designated PM<sub>2.5</sub> nonattainment areas are not current or former PM<sub>10</sub> nonattainment areas. Thus, some existing stationary sources in these areas may currently be uncontrolled or undercontrolled for PM or PM precursors. Further, emissions controls for existing sources in these areas may focus primarily on particulate matter that is filterable at stack temperatures and thus may not adequately control condensable emissions. In addition, States should bear in mind that the controlled sources may have installed emission controls 15 years ago or more, and now there may be cost-effective opportunities available to reduce emissions further through more comprehensive and improved emissions control technologies, or through production process changes that are inherently lower in emissions.

Moreover, improved monitoring methods may enhance the ability of sources to maintain the effectiveness of installed emissions controls and to reduce emissions by detecting equipment failures more quickly. For example, State imposition of requirements for more frequent monitoring (e.g., continuous opacity monitors, PM continuous emissions monitors, etc.) may provide greater assurance of source compliance and quicker correction of inadvertent upset emissions conditions than existing approaches.

Third, even in former or current PM<sub>10</sub> nonattainment areas, existing requirements for controlling direct PM emissions (e.g., with a baghouse or electrostatic precipitator) may not have been revised significantly since the 1970's. When EPA established the PM<sub>10</sub> standards in 1987, we stated in the General Preamble that it was reasonable to assume that control technology that represented RACT for total suspended particulates (TSP) should satisfy the requirement for RACT for PM<sub>10</sub>. The rationale for this provision was that controls for PM<sub>10</sub> and TSP would both be focused on reducing coarse particulate matter, and specifically that fraction of particulate matter that is solid (rather than gaseous or condensable) at typical stack

<sup>72</sup> EPA must initially rely on the States to provide the necessary analysis and documentation to show whether RACT measures would advance the attainment date at least one year. It should be noted that although the court upheld EPA's interpretation of § 172(c)(1) in *Sierra Club v. EPA*, *supra*, the court also concluded in that case that neither the local government authority nor EPA had provided an adequate analysis to support the determination that certain control measures were not in fact capable of advancing the attainment date for that area.

temperatures. However, emission controls to capture coarse particles in some cases may be less effective in controlling PM<sub>2.5</sub>. For this reason, there may be significant opportunities for sources to upgrade existing control technologies<sup>73</sup> and compliance monitoring methods to address direct PM emissions contributing to fine particulate matter levels with technologies that have advanced significantly over the past 15 years.

Fourth, it will be important for States to conduct RACT determinations for stationary sources of PM<sub>2.5</sub> precursors as well as direct PM<sub>2.5</sub> emissions. A significant fraction of PM<sub>2.5</sub> mass in most areas violating the standards is attributed to secondarily-formed components such as sulfate, nitrate, and carbonaceous PM, and EPA believes that certain stationary sources of these precursors in nonattainment areas currently may be poorly controlled. Accordingly, to address these precursors, States should review existing sources for emission controls or process changes that could be reasonably implemented to reduce emissions from activities such as fuel combustion, industrial processes, and solvent usage.

Finally, EPA believes that the proper and timely implementation of RACT by the States is a relevant criterion in assessing State requests for any attainment date extension of the applicable attainment date. Because EPA anticipates that most States will conclude that RACT controls are appropriate and consistent with meeting RFP requirements and with expeditious attainment of the standards, EPA assumes that States will include a detailed RACT analysis in connection with any extension request. The EPA proposes that any State that seeks an attainment date extension of 1 to 5 years beyond the initial 5-year attainment date provided in section 172(a)(2) must, among other things, submit a demonstration satisfactory to EPA showing that the State has implemented all RACT for the appropriate sources in that State in order to meet RFP requirements and to provide for attainment of the PM<sub>2.5</sub> standards as expeditiously as practicable.

EPA requests comment on all aspects of the proposed alternatives and guidance for implementing the RACT requirement discussed above.

<sup>73</sup> For example, see past EPA guidance on PM<sub>2.5</sub> control technologies: Stationary Source Control Techniques Document for Fine Particulate Matter (EPA-452/R-97-001), EPA Office of Air Quality Planning and Standards, October 1998.

6. What factors should States consider in determining whether an available control technology is technically feasible?

The technological feasibility of applying an emission reduction method to a particular source should consider factors such as the source's process and operating procedures, raw materials, physical plant layout, and any other environmental impacts such as water pollution, waste disposal, and energy requirements. For example, the process, operating procedures, and raw materials used by a source can affect the feasibility of implementing process changes that reduce emissions and the selection of add-on emission control equipment. The operation of, and longevity of, control equipment can be significantly influenced by the raw materials used and the process to which it is applied. The feasibility of modifying processes or applying control equipment also can be influenced by the physical layout of the particular plant. The space available in which to implement such changes may limit the choices and will also affect the costs of control.

Reducing air emissions may not justify adversely affecting other resources by increasing pollution of bodies of water, creating additional solid waste disposal problems or creating excessive energy demands. An otherwise available control technology may not be reasonable if these other environmental impacts cannot reasonably be mitigated. For analytic purposes, a State may consider a PM<sub>2.5</sub> control measure technologically infeasible if, considering the availability (and cost) of mitigative adverse impacts of that control on other pollution media, the control would not, in the State's reasoned judgment, provide a net benefit to public health and the environment. In many instances, however, PM<sub>2.5</sub> control technologies have known energy penalties and adverse effects on other media, but such effects and the cost of their mitigation are also known and have been borne by owners of existing sources in numerous cases. Such well-established adverse effects and their costs are normal and assumed to be reasonable and should not, in most cases, justify rejection of the potential PM<sub>2.5</sub> control technology. The costs of preventing adverse water, solid waste and energy impacts will also influence the economic feasibility of the PM<sub>2.5</sub> control technology.

EPA recommends that States evaluate alternative approaches to reducing emissions of particulate matter by

reviewing existing EPA guidance<sup>74</sup> and other sources of control technology information. In EPA's 1998 guidance, the design, operation and maintenance of general particulate matter control systems such as electrostatic precipitators, fabric filters, and wet scrubbers are presented. The filterable particulate matter collection efficiency of each system is discussed as a function of particle size. Information is also presented regarding energy and environmental considerations and procedures for estimating costs of particulate matter control equipment. Secondary environmental impacts are also discussed. Because control technologies and monitoring approaches are constantly being improved, the State should also consider more updated or advanced technologies not referenced in this 1998 guidance when conducting a RACT determination. Emissions reductions may also be achieved through the application of monitoring and maintenance programs that use critical process and control parameters to verify that emission controls are operated and maintained so that they more continuously achieve the level of control that they were designed to achieve.<sup>75</sup>

7. What factors should States consider in determining whether an available control technology is economically feasible?

Economic feasibility considers the cost of reducing emissions and the difference between the cost of the emissions reduction approach at the particular source and the costs of emissions reduction approaches that have been implemented at other similar sources. Absent other indications, EPA presumes that it is reasonable for similar sources to bear similar costs of emission reduction. Economic feasibility for RACT purposes is largely determined by evidence that other sources in a source category have in fact applied the control technology or process change in question.

The capital costs, annualized costs, and cost effectiveness of an emission reduction technology should be considered in determining its economic feasibility. The EPA Air Pollution

<sup>74</sup> Stationary Source Control Techniques Document for Fine Particulate Matter (EPA-452/R-97-001), EPA Office of Air Quality Planning and Standards, October 1998. See also: Controlling SO<sub>2</sub> Emissions: A Review of Technologies (EPA/600/R-00/093), EPA Office of Research and Development, November 2000.

<sup>75</sup> See EPA's website for more information: <http://www.epa.gov/ttn/emc/monitor.html>.

Control Cost Manual<sup>76</sup> describes procedures for determining these costs for stationary sources. The above costs should be determined for all technologically feasible emission reduction options.

States may give substantial weight to cost effectiveness in evaluating the economic feasibility of an emission reduction technology. The cost effectiveness of a technology is its annualized cost (\$/year) divided by the emissions reduced (*i.e.*, tons/year) which yields a cost per amount of emission reduction (\$/ton). Cost effectiveness provides a value for each emission reduction option that is comparable with other options and other facilities.

In considering what level of control is reasonable, EPA is not proposing a fixed dollar per ton cost threshold for RACT. We believe that what is considered to be a reasonable control level should vary based on the severity of the nonattainment problem in the area. In addition, we believe that in determining what are appropriate emission control levels, the State should also consider the collective health benefits that can be realized in the area due to projected improvements in air quality. The health benefits associated with reducing PM<sub>2.5</sub> levels are significant. Using estimation techniques reviewed and deemed reasonable by the National Academy of Sciences, national monetized health benefits resulting from reductions in PM concentrations are estimated to exceed emission control costs by a factor of three to thirty times, depending on the particular controls on sources of PM precursor emissions.<sup>77</sup> This approach is consistent with EPA's view that RACT may be related to what is needed for attainment. That is, for options where RACT is met where an area demonstrates timely attainment and areas with more severe air quality problems typically will need to adopt more stringent controls, RACT level controls in such areas will require controls at higher cost effectiveness levels (\$/ton) than areas with less severe air quality problems.

Areas with more serious air quality problems typically will need to obtain greater levels of emissions reductions from local sources than areas with less

serious problems, and it would be expected that their residents could realize greater health benefits. For this reason, we believe that it will be reasonable and appropriate for areas with more serious air quality problems and higher design values to impose emission reduction requirements with generally higher costs per ton of reduced emissions than the cost of emissions reductions in areas with lower design values.

If a source contends that a source-specific RACT level should be established because it cannot afford the technology that appears to be RACT for other sources in its source category, the source should support its claim with such information regarding the impact of imposing RACT on:

1. Fixed and variable production costs (\$/unit),
  2. Product supply and demand elasticity,
  3. Product prices (cost absorption vs. cost pass-through),
  4. Expected costs incurred by competitors,
  5. Company profits, and
  6. Employment costs.
8. How should condensable emissions be treated in RACT determinations?

Certain commercial or industrial activities involving high temperature processes (fuel combustion, metal processing, cooking operations, etc.) emit gaseous pollutants into the ambient air which rapidly condense into particle form. The constituents of these condensed particles include, but are not limited to, organic material, sulfuric acid, and metals. In general, condensable emissions are taken into account wherever possible in emission factors used to develop national emission inventories, and States are required under the consolidated emissions reporting rule (CERR)<sup>78</sup> to report condensable emissions in each inventory revision. Currently, some States have regulations requiring sources to quantify condensable emissions and to implement control measures for them, and others do not. In 1990, EPA promulgated Method 202 in Appendix M of 40 CFR Part 51 to quantify condensable particulate matter emissions.

EPA is in the process of developing detailed guidance on a new test method which quantifies and can be used to characterize the constituents of the PM<sub>2.5</sub> emissions including both the filterable and condensable portion of the

emissions stream. (See section III.P for more information.) When a source implements either of these test methods addressing condensable emissions, the State will likely need to revise the source's emissions limit to account for those emissions that were previously unregulated. For the purposes of determining RACT applicability and establishing RACT emission limits, EPA intends to require the State to adopt the new test method once EPA issues its detailed guidance for use by all sources within a PM<sub>2.5</sub> nonattainment area that are required to reduce emissions as part of the area's attainment strategy. The EPA requests comment on this proposal with respect to addressing condensable emissions in PM<sub>2.5</sub> RACT determinations.

9. What are the required dates for submission and implementation of RACT measures?

States must submit adopted RACT rules to EPA within three years of designation, at the same time as the attainment demonstration due in April 2008. States should also implement any measures determined to be RACT expeditiously, as required by section 172. Implementation of RACT measures should start no later than the beginning of the final year of the three-year period on which attainment is to be assessed. (See section I.11. for a discussion of RACT for sources subject to CAIR.) For example, if an area has an attainment date of April 2010, then any required RACT measures should be in place and operating no later than the beginning of 2009, so that their effect will be reflected in the air quality levels for calendar year 2009. (See related-discussion in section I.11. on the interaction of CAIR and RACT.) If the area has recorded air quality levels above 15.1 µg/m<sup>3</sup> for the first two years of the three-year period, then it is possible that implementation of the emission controls in the third year could enable the area to have improved air quality below 15.1 and thereby be eligible to receive a one-year attainment date extension.

While EPA expects that States will implement required RACT controls by January 2009 in most situations, there may be cases where additional implementation time is needed to implement an innovative control measure or to achieve a greater level of reduction through a phased approach. If an area has provided an adequate demonstration showing that an attainment date extension would be appropriate, then the area may consider phasing-in certain RACT controls after January 2009. Implementation of

<sup>76</sup> EPA Air Pollution Control Cost Manual—Sixth Edition (EPA 452/B-02-001), EPA Office of Air Quality Planning and Standards, Research Triangle Park, NC, Jan 2002.

<sup>77</sup> U.S. EPA, 2003 Technical Support Package for Clear Skies; U.S. EPA, 2003. See also: Draft Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines. United States Environmental Protection Agency Office of Air and Radiation EPA420-R-03-008, April 2003.

<sup>78</sup> The consolidated emissions reporting rule was published in the **Federal Register** on June 10, 2002, pages 39602-39616.



selected RACT controls after January 2009 would only be allowable if the state can show why additional time is needed for implementation, and still would need to be on a schedule that provides for expeditious attainment. In no event could the area wait to implement RACT controls until the last few years prior to the attainment date. EPA requests comments on this approach for RACT implementation.

10. Under the PM<sub>2.5</sub> implementation program, does a State need to conduct a RACT determination for an applicable source that already has a RACT determination in effect?

In PM<sub>2.5</sub> nonattainment areas, States are required to implement the RACT requirement to reduce emissions of direct PM<sub>2.5</sub> and PM<sub>2.5</sub> precursors from applicable sources. Under this proposal, RACT would need to be addressed for emissions of SO<sub>2</sub> and NO<sub>x</sub> in all areas. For VOC and ammonia, this proposal would require RACT to be addressed only in those areas for which EPA or the State provides a determination that the pollutant is a significant contributor to the local PM<sub>2.5</sub> problem.

The sources subject to RACT in a particular nonattainment area will depend on which RACT option described in section III.I.5 is adopted in the final rule. Under EPA's preferred option, an area projected to attain within five years after designations (by April 2010) according to the attainment demonstration would need to impose RACT controls only on those sources as necessary to attain as expeditiously as practicable. An area projected to attain in more than five years would be required to conduct RACT determinations for all sources exceeding a particular emissions threshold.

EPA anticipates that for a number of sources located in a PM<sub>2.5</sub> nonattainment area, the State would have previously conducted RACT determinations for VOC or NO<sub>x</sub> under the 1-hour ozone standard, or for direct PM<sub>10</sub> emissions under the PM<sub>10</sub> standards. Some of the RACT determinations established under these other programs would have been made more recently, while other determinations will be more than ten years old. In some cases, a new RACT determination would call for the installation of similar control technology as the initial RACT determination because the relevant pollutant was addressed, the same emission points were reviewed, and the same fundamental control techniques would still have similar costs. In other cases, a new RACT analysis could determine, for example, that better

technology has become available, and that cost-effective emission reductions are achievable.

For these reasons, EPA recommends that the State should closely review any existing RACT determinations established under another NAAQS program. We believe States must consider new information that has become available since the original RACT determination. EPA proposes that where major sources or source categories were previously reviewed and sources subsequently installed controls to meet the RACT requirement for the pollutant(s) in question, States would be allowed to accept the initial RACT analysis as meeting RACT for purposes of the PM<sub>2.5</sub> program, provided that the State submits as part of its SIP revision a certification with appropriate supporting information that it previously met the RACT requirement for these sources as part of its prior SIP revision, and that the previous determination currently represents an appropriate RACT level of control for PM<sub>2.5</sub>. In the alternative, the State should revise the SIP to reflect a modified RACT requirement for specific sources or source categories.

In any case where additional information on updated control technologies is presented as part of notice-and-comment rulemaking, including a RACT SIP submittal for sources previously controlled, States (and EPA) must consider the additional information as part of that rulemaking. In cases where the State's RACT analysis previously concluded that no additional controls were necessary, we propose that a new RACT determination is required for that source. The new RACT determination is needed to take into account that newer, cost-effective control measures may have become available for sources that were not previously regulated. EPA believes it may not always be sufficient for a State to rely on technology guidance that is several years old in conducting new RACT determinations. States should take into account appropriate information about updated control technologies as well as any additional information obtained through public comments when conducting RACT determinations for PM<sub>2.5</sub>.

EPA requests comment on the policy approach described above for taking existing RACT determinations into account, and on the following questions: (1) Should new RACT determinations be required for all existing determinations that are older than a specified amount of time (such as 10 years old)?; (2) what supporting information should a state be required to submit as part of its

certification to demonstrate that a previous RACT analysis meets the RACT requirement currently for purposes of the PM<sub>2.5</sub> program?

Prior BACT/LAER/MACT determinations. In many cases, but not all, best available retrofit technology (BACT) or lowest achievable emission rate (LAER) provisions for new sources would assure at least RACT level controls on such sources. The BACT/LAER analyses do not automatically ensure compliance with RACT since the regulated pollutant or source applicability may differ and the analyses may be conducted many years apart. States may, however, rely on information gathered from prior BACT or LAER analyses for the purposes of showing that a source has met RACT to the extent the information remains valid. We believe that the same logic holds true for emissions standards for municipal waste incinerators under CAA section 111(d) and NSR/PSD settlement agreements. Where the State is relying on these standards to represent a RACT level of control, the State should present their analysis with their determination during the SIP adoption process.

In situations where the State has determined VOC to be a significant contributor to PM<sub>2.5</sub> formation in an area, compliance with MACT standards may be considered in VOC RACT determinations. For VOC sources subject to MACT standards, States may streamline their RACT analysis by including a discussion of the MACT controls and relevant factors such as whether VOCs are well controlled under the relevant MACT air toxics standard, which units at the facility have MACT controls, and whether any major new developments in technologies or costs have occurred subsequent to the MACT standards. We believe that there are many VOC sources that are well controlled (e.g., through add-on controls or through substitution of non-VOC non-HAP materials for VOC HAP materials) because they are regulated by the MACT standards, which EPA developed under CAA section 112. Any source subject to MACT standards must meet a level that is as stringent as the best-controlled 12 percent of sources in the industry. Examples of these HAP sources that may effectively control VOC emissions include organic chemical plants subject to the hazardous organic NESHAP (HON), pharmaceutical production facilities, and petroleum refineries.<sup>79</sup> We believe

<sup>79</sup> However, there are some MACT categories for which it may not be possible to determine the

that, in many cases, it will be unlikely that States will identify emission controls more stringent than the MACT standards that are not prohibitively expensive and thus unreasonable. We believe this will allow States, in many cases, to rely on the MACT standards for purposes of showing that a source has met VOC RACT.

Year-round controls. In some cases, sources subject to NO<sub>x</sub> RACT for PM will also be subject to controls under the NO<sub>x</sub> SIP Call. We proposed in the 8-hour ozone implementation rule that certain sources which have installed emission controls to comply with the NO<sub>x</sub> SIP call would be deemed to meet NO<sub>x</sub> RACT for the purposes of the 8-hour ozone implementation program. Some of these sources subject to the NO<sub>x</sub> SIP call may choose to control NO<sub>x</sub> emissions only or primarily during the ozone season. For purposes of PM, however, EPA believes that the operation of emission controls only or primarily during the ozone season would not constitute RACT for PM purposes. Instead, EPA believes that RACT for PM should be year-round operation of controls because PM concentrations are a year-round problem and NO<sub>x</sub> emissions have a more significant role in PM formation in cooler temperatures.

As described above, the PM RACT determination is made on a case-by-case basis. For sources subject to both the NO<sub>x</sub> SIP call and NO<sub>x</sub> RACT for PM, we believe that, in most cases, the additional costs of running the NO<sub>x</sub> SIP call controls year-round would be feasible and the cost effectiveness would be lower than the average cost effectiveness for many other sources subject to PM RACT. For example, if a source that has installed selective catalytic reduction to comply with the NO<sub>x</sub> SIP call extends operation of the control equipment from just during the ozone season to year-round, it would only incur additional operating costs but would achieve substantial additional emissions reductions. Thus, where sources have installed controls to meet the NO<sub>x</sub> SIP call, we believe that in most cases, RACT for PM would require running the emission controls year-round.

#### 11. What policies affect compliance with RACT for electric generating units?

*Overview.* The Clean Air Interstate Rule (CAIR) (70 FR 25162) provides for a cap-and-trade mechanism that States

degree of VOC reductions from the MACT standard without additional analysis; for example, the miscellaneous metal parts and products (40 CFR part 60, subpart MMMM) due to the uncertainty of the compliance method that will be selected.

may choose to use to achieve the emissions reductions required by CAIR. Under the cap-and-trade program, electric generating units (EGUs)<sup>80</sup> must collectively reduce their emissions of SO<sub>2</sub> and NO<sub>x</sub> across a multi-state area in order to comply with emissions caps for these pollutants. A source subject to a cap-and-trade program such as the CAIR trading program generally has the option of installing emissions control technology, adopting some other strategy (such as using lower sulfur coal) to control its emissions, or purchasing emissions allowances and thereby effectively paying another source covered by the cap to reduce its emissions. The initial CAIR NO<sub>x</sub> cap is effective in 2009, and the initial CAIR SO<sub>2</sub> cap is effective in 2010. However, EPA analysis shows that sources covered by the SO<sub>2</sub> trading program will make significant reductions in their SO<sub>2</sub> emissions well before 2010 because they are able to "bank" these early reductions. EPA also expects some early NO<sub>x</sub> reductions due to the opportunity for states to use their portion of the compliance supplement pool to award credit for early annual NO<sub>x</sub> reductions.

Although we expect that many EGUs that will be subject to mandatory requirements under the cap-and-trade program under CAIR will not be located in PM<sub>2.5</sub> nonattainment areas, some of these units will be located in nonattainment areas and thus will be subject to RACT requirements for large stationary sources. As discussed elsewhere in this section, RACT is one of the basic subpart 1 control requirements for nonattainment areas. Under the Clean Air Act, a source subject to CAIR that is located within a nonattainment area is also subject to the nonattainment RACT provisions for emissions of PM<sub>2.5</sub> and nonattainment plan precursors (including SO<sub>2</sub> and, in the absence of a finding that NO<sub>x</sub> is not a significant contributor, NO<sub>x</sub>).

In this rulemaking, EPA is proposing to determine that in states that fulfill their CAIR emission reductions entirely through emission reductions from EGUs, CAIR would satisfy SO<sub>2</sub> RACT requirements for EGU sources in eastern PM<sub>2.5</sub> nonattainment areas covered by CAIR. EPA is proposing a similar finding for NO<sub>x</sub> RACT for EGUs, subject to a requirement that existing SCRs in those nonattainment areas be operated year-round beginning in 2009. The EPA believes that the SIP provisions for those sources meet the ozone Nox RACT requirement. A State that is relying on this conclusion for the affected sources

<sup>80</sup> Under CAIR, states may allow other units to opt into the trading program.

should document this reliance in its RACT SIP.

*SO<sub>2</sub> RACT.* As stated elsewhere in this proposal, RACT controls in PM<sub>2.5</sub> nonattainment areas should be in place and operational by the beginning of 2009 unless an attainment date extension is obtained. As discussed more fully in the CAIR final rulemaking notice, EPA has set the 2009 and 2010 CAIR caps at a level that will require EGUs to install emission controls on the maximum total capacity on which it is feasible to install emission controls by those dates. Although the actual SO<sub>2</sub> cap does not become effective until 2010, we have designed "banking" provisions in CAIR so that covered EGUs will begin to reduce their SO<sub>2</sub> emissions almost immediately after CAIR is finalized, and will continue steadily to reduce their emissions in anticipation of the 2010 cap and the more stringent cap that becomes effective in 2015. The 2015 SO<sub>2</sub> and NO<sub>x</sub> caps are specifically designed to eliminate all SO<sub>2</sub> and NO<sub>x</sub> emissions from EGUs that are highly cost effective to control (the first caps represent an interim step toward that end). In general, we expect that the largest-emitting sources will be the first to install SO<sub>2</sub> and NO<sub>x</sub> control technology and that such control technology will gradually be installed on progressively smaller-emitting sources until the ultimate cap is reached.

We do not believe that requiring source-specific RACT controls on EGUs in nonattainment areas will reduce total SO<sub>2</sub> and NO<sub>x</sub> emissions from sources covered by CAIR below the levels that would be achieved under CAIR alone. In fact, if states chose to require smaller-emitting sources in nonattainment areas to meet source-specific RACT requirements by 2009, they would likely use labor and other resources that would otherwise be used for emission controls on larger sources. Because of economies of scale, more boiler-makers may be required per megawatt of power generation for smaller units than larger units. In this case, the imposition of source-specific RACT on smaller emitting sources by 2009 could actually reduce the amount of "banking" that would otherwise occur and result in higher SO<sub>2</sub> emissions in 2009 as compared to the level that would result from CAIR alone.

In any event, the imposition of source-specific control requirements on a limited number of sources also covered by a cap-and-trade program would not reduce the total emissions from sources subject to the program. Under a cap-and-trade program such as CAIR, there is a given number of

allowances that equals a given emission level. Source-specific control requirements may affect the temporal distribution of emissions (by reducing banking and thus delaying early reductions) or the spatial distribution of emissions (by moving them around from one place to another), but it does not affect total emissions. If source-specific requirements were targeted at the units that can be controlled most cost-effectively, then the imposition of source-specific controls would likely achieve the same result as the cap-and-trade program. If not, however, the imposition of source-specific requirements would make any given level of emission reduction more costly than it would be under the cap-and-trade program alone. Thus, the imposition of source-specific RACT on EGUs covered by CAIR would not reduce total emissions, but would likely achieve the same total emission reductions in a more costly way.

We recognize that the RACT provisions are an important tool to help nonattainment areas come into attainment. However, neither EPA nor the States have determined what would constitute SO<sub>2</sub> and NO<sub>x</sub> RACT on EGUs for the purpose of the PM<sub>2.5</sub> implementation program. Therefore, it is not possible to determine at this time whether, for any particular PM<sub>2.5</sub> nonattainment area, CAIR or the imposition of RACT on EGUs located in that area would achieve greater emissions reductions from those specific EGUs. We are confident, however, that CAIR will provide substantial SO<sub>2</sub> emissions reductions in most nonattainment areas in the CAIR region, as well as substantial SO<sub>2</sub> reductions in attainment areas, which together will substantially improve air quality in PM<sub>2.5</sub> nonattainment areas in the CAIR region. EPA requests comment on this option in which EGUs located within PM<sub>2.5</sub> nonattainment areas would be considered to meet their SO<sub>2</sub> RACT requirements through participation in the CAIR trading program.

**NO<sub>x</sub> RACT.** With respect to NO<sub>x</sub>, we propose to find that, for EGUs subject to CAIR SIPs, CAIR satisfies NO<sub>x</sub> RACT in PM<sub>2.5</sub> nonattainment areas, except that in addition, the state's SIP must ensure that any source that has selective catalytic reduction (SCR) technology for summertime NO<sub>x</sub> control will operate the SCR year-round, starting by the beginning of 2009. In the CAIR final rulemaking notice, EPA found that the operation of existing SCRs on a year-round basis, instead of operating them only during the ozone season, could achieve NO<sub>x</sub> reductions at low cost relative to other available NO<sub>x</sub> controls

for EGUs or for other sectors. EPA projected that power generators would employ this control measure for CAIR compliance. Based on this control opportunity, EPA estimated the average cost of non-ozone-season NO<sub>x</sub> control at \$500/ton. These considerations support a finding that RACT should include year-round operation of existing SCRs that are located in PM<sub>2.5</sub> nonattainment areas. "Existing" SCR would be defined to include those in place by the date of proposal of this rule; using the proposal date rather than the final rule date would avoid creating a potential incentive to delay installation of new SCR. Because all areas violate the annual form of the PM<sub>2.5</sub> standard and public health can be affected by high PM<sub>2.5</sub> levels in the winter as well as the summer, we believe that year-round operation of existing SCR in nonattainment areas will provide additional health benefits for relatively low dollar cost per ton of pollutant reduced.

The Act requires RACT to be implemented as expeditiously as practicable (and, in the case of areas without an attainment date extension, no later than 2009). EPA has considered the following factors in proposing January 1, 2009, as the compliance date for year-round operation of existing SCR. Depending on the source, year-round operation of existing SCR involves either no alteration or relatively minor alteration of existing equipment. For EGUs where these alterations are needed, we expect the work to be conducted during a routine outage at a unit, which typically occurs one or more times a year. Finally, a year-round operation requirement would not be legally applicable to individual sources until the RACT SIP is adopted. We note that all EGUs in PM<sub>2.5</sub> nonattainment areas would be on notice from the date this rule is finalized that RACT SIPs must require year-round operation of existing SCRs. Taking these factors into account, EPA believes that a January 1, 2009, implementation date would provide ample lead time to enable existing SCRs in PM<sub>2.5</sub> nonattainment areas to be operated year-round, including those SCRs for which physical alterations are necessary. EPA requests comment on the proposal to find that for an EGU located in a PM<sub>2.5</sub> nonattainment area in the CAIR region and having selective catalytic reduction control technology to reduce NO<sub>x</sub> emissions, compliance with CAIR satisfies NO<sub>x</sub> RACT, provided the State's SIP ensures that the source operates the SCR year-round, starting no later than the beginning of 2009.

*RACT for sources in states requiring non-EGU reductions for CAIR compliance or allowing non-EGUs to "opt into" CAIR.* Under CAIR, a State may elect to meet its state caps for SO<sub>2</sub> and NO<sub>x</sub> emissions by requiring emissions reductions from SO<sub>2</sub> and NO<sub>x</sub> sources that are not electric generating units. A second, separate option allowed under CAIR is that the state may elect to allow non-EGU sources to voluntarily enter the EPA-administered CAIR trading program through an opt-in provision in the CAIR model rule. If only part of a state's CAIR reductions are achieved by EGUs, and the balance of the reductions obtained from non-EGU sources, then the stringency of CAIR EGU control would be diminished to some extent (an amount that cannot be determined until the State submits a SIP indicating which sources are participating in the program). Therefore, in these cases, the above rationale for our judgment that CAIR satisfies RACT would not apply. For this reason, a state selecting either of the above non-EGU options in implementing CAIR would need to conduct RACT analyses for EGUs in its PM<sub>2.5</sub> nonattainment areas (either on an individual basis, or using the averaging approach within the nonattainment area) to determine whether the lesser EGU reductions satisfy RACT.

For clarity, it should be noted that a State has authority to conduct its own RACT analysis for any source. Also, the proposed approach to CAIR and RACT would not prevent a state from requiring beyond-RACT controls to provide for expeditious attainment.

*RACT averaging concept.* In addition to the option above relating to EGU compliance with CAIR and RACT for PM<sub>2.5</sub>, we propose to provide states with a nonattainment area RACT averaging option for EGU's previously available in the ozone program. We also propose to make this option available to non-EGU categories for which accountability of an averaging system could be assured.

The EPA's NO<sub>x</sub> RACT guidance (NO<sub>x</sub> General Preamble at 57 FR 55625) under the ozone program encourages States to develop NO<sub>x</sub> RACT programs for EGU's that are based on "areawide average emission rates." Thus, EPA's 1992 policy for ozone RACT provides for States to submit a demonstration as part of their RACT submittal showing that the weighted average emission rate from EGU sources in the nonattainment area subject to RACT—including sources reducing emissions to meet the NO<sub>x</sub> SIP Call or CAIR NO<sub>x</sub> requirements—meet RACT requirements. Under this approach, emission reductions within the nonattainment area must be at least

equivalent to the emission reductions that would result from collective application of source-specific RACT within the nonattainment area.

We envision that the state would first identify presumptive RACT for a set of emissions sources, as EPA has not issued guidance on RACT for PM<sub>2.5</sub> purposes. The state would then propose a program that would assure collective emissions reductions equivalent or greater than the emissions reductions that would be achieved if the presumptive RACT level were met by each individual source.

EPA proposes that the approach described above be available as a way for states to show that EGUs in PM<sub>2.5</sub> nonattainment areas comply with RACT for NO<sub>x</sub> and SO<sub>2</sub>. Similarly, EPA proposes that this option be available to non-EGUs. As with other economic incentive programs, an approvable program would be required to ensure emissions reductions that are quantifiable, surplus, enforceable and permanent, and provide an environmental benefit.<sup>81</sup>

We generally solicit comment on whether RACT averaging should be permitted in PM<sub>2.5</sub> areas for EGUs and non-EGUs, and which non-EQU source categories have adequate monitoring methods available to provide for accountability in an emissions trading program. In addition, we solicit comment on the following topics:

- Whether RACT averaging in PM<sub>2.5</sub> nonattainment areas, if permitted for both EGUs and non-EGUs, should be separate for EGUs and for non-EGUs, or whether averaging among EGUs and non-EGUs should be permitted
- Whether a collective approach to RACT should be implemented through a rate-based approach (mass of emissions per activity level) involving weighted average emission rates (e.g., pounds of NO<sub>x</sub> per MMBtu of heat input), or through a cap-and-trade approach that controls total emissions regardless of activity level.
- The appropriate averaging period for showing compliance with RACT for PM<sub>2.5</sub> purposes

12. Is EPA developing PM<sub>2.5</sub> control techniques guidelines for specific source categories?

To date, EPA has not developed a series of control techniques guidelines for specific source categories for the purposes of PM<sub>2.5</sub> implementation. However, there are a number of sources of information on recent control

technologies and other approaches for reducing PM<sub>2.5</sub> and precursor emissions from stationary sources that are available to States and Tribes and can be helpful in making RACT determinations on a source category or source-specific basis. These sources of information include EPA's 1998 guidance document on stationary source control measures, a 1996 particulate matter "Menu of Options" document by STAPPA/ALAPCO,<sup>82</sup> and the EPA's Clean Air Technology Center website.<sup>83</sup> The Clean Air Technology Center website includes a wide variety of control technology information, including summaries of previous RACT determinations for other NAAQS programs, as well as assessments for best available control technology (BACT) and lowest achievable emissions rate (LAER) under the NSR and prevention of significant deterioration programs.

Under the implementation program for the 1-hour ozone standard, a number of control techniques guidance (CTG) and alternative control technology (ACT) documents have been developed for sources of NO<sub>x</sub> and VOC over the past 25 years. (CTGs include a presumptive RACT level while ACTs do not. However, ACTs are intended to help States in making RACT determinations.) Over a five year period, 1991–94, EPA issued nine alternative control technique guideline documents for large stationary sources of NO<sub>x</sub>. In 2000, updates to the NO<sub>x</sub> ACT documents were completed for stationary internal combustion engines and cement kilns. In addition, EPA issued a number of CTGs in the 1980's for various source categories of NO<sub>x</sub> and VOC.

As discussed in section III.I.10 above, EPA recognizes that control technology guidance for certain source categories has not been updated for many years. Section 183(c) of the CAA, which addresses control technologies to address ozone nonattainment problems, requires EPA to "revise and update such documents as the Administrator determines necessary." As new or updated information becomes available States should consider the new information in their RACT determinations. A State should consider the new information in any RACT determinations or certifications that have not been issued by the State as of

the time such updated information becomes available.<sup>84</sup>

In addition, EPA is considering related recommendations from the Air Quality Management Work Group to the Clean Air Act Advisory Committee (CAAAC) dated January 2005. One of the recommendations to the CAAAQ is that "for the SIPs States are required to submit over the next several years, EPA and States, locals, and Tribes should promote the consideration of multipollutant impacts, including the impacts of air toxics, and where there is discretion, select regulatory approaches that maximize benefits from controlling key air toxics, as well as ozone, PM<sub>2.5</sub> and regional haze." As part of this effort, EPA intends in the future to develop updated technology guidance with respect to source categories emitting multiple pollutants in large amounts. At this time, however, we think it is unlikely that updated technology guidance will be available prior to 2006. The EPA also intends to maintain an updated list of references for new PM<sub>2.5</sub> control technology options. We request that commenters submit any additional references for PM<sub>2.5</sub> control technology information that may be useful for state program implementation efforts.

We also have provided STAPPA/ALAPCO with funding to update its 1996 Particulate Matter Menu of Options document with additional information regarding control measures to reduce PM<sub>2.5</sub> and its precursors. STAPPA/ALAPCO will be able to draw on the information and experience of its broad national membership in developing this updated guidance document for PM<sub>2.5</sub>. While we anticipate that this guidance document will provide very useful updated information for regulatory agencies and affected sources, the specifications in this privately-issued document will not be binding on States, sources, or EPA.

### 13. Background for RACM

The proposed approach for implementing the RACM requirement for PM<sub>2.5</sub> is generally consistent with the approach followed under other NAAQS implementation programs. Under this approach, the State is required to provide a demonstration in its SIP that it has adopted all reasonably available measures needed to meet RFP and to attain the standard as expeditiously as

<sup>82</sup> *Controlling Particulate Matter Under the Clean Air Act: A Menu of Options*, STAPPA/ALAPCO, July 1996.

<sup>83</sup> See EPA's website at <http://www.epa.gov/ttn/catc> for the Clean Air Technology Center and RACT/BACT/LAER Clearinghouse.

<sup>84</sup> Available at: <http://www.epa.gov/air/caaac/aqm.html#library> in response to the recent National Research Council report on *Air Quality Management in the United States* (January 2004) [available for sale; individual pages available for viewing at <http://www.nap.edu/books/0309089328/html>].

<sup>81</sup> Economic incentive program guidance, "Improving Air Quality With Economic Incentive Programs," January 2001.

practicable. The demonstration should show that there are no additional reasonable measures available that would advance the attainment date by at least one year or contribute to RFP for the area. Reasonable measures are those measures that are technologically and economically feasible within the nonattainment area.

Under section 172, the attainment date for a nonattainment area is presumed to be within five years or less after the effective date of designation of the area (e.g., no later than April 2010 for the final designations December 2004). Each State is required to evaluate all RACM in the area to determine if any such measures could contribute to RFP or attainment as expeditiously as practicable. If this evaluation of all RACM finds that the State will not be able to demonstrate attainment within five years of designation based on the severity of the problem or the availability or feasibility of implementing controls, then the State may request an attainment date extension. The EPA may extend the attainment date for a period of 1 to 5 years, provided the State has presented an adequate demonstration showing they will implement all RACT and RACM as expeditiously as practicable, and still need additional time to attain.

#### 14. What is the proposed approach for implementing RACM?

The State should begin the process of determining RACM by identifying all available control measures in the nonattainment area. RACM can apply to mobile sources, area sources, and stationary sources not already subject to PM<sub>2.5</sub> RACT requirements. If the State receives substantive public comment demonstrating through appropriate documentation that other specific control measures may be available for existing emissions sources or activities in the area, then the State or local agency must also closely review those additional control measures and determine if they are reasonably available for the area in light of local circumstances.

After the universe of available measures have been identified for the sources in the area, the State should evaluate them to determine whether implementation of such measures is technically and economically feasible, and whether the measure will contribute to advancing the attainment date. The State should consider the feasibility of partial implementation of certain measures when "full" implementation would be infeasible. For example, if a State is considering diesel retrofits of school buses to be

RACM for an area, it may not be feasible to retrofit all school buses in the nonattainment area, but it may be feasible to retrofit buses for specific school districts. The burden is with the State to provide a demonstration to EPA containing the justification and supporting documentation describing which measures it has determined to be RACM, and which it has not.

Because the local circumstances for each area (e.g., design value, variety of emissions sources, contribution of each PM<sub>2.5</sub> precursor to overall PM<sub>2.5</sub> mass) will be different, the set of measures that constitute RACM are expected to vary from area to area. We anticipate that what may be considered RACM in one area may not be considered RACM in another. For example, certain transportation control measures, such as high occupancy vehicle (HOV) lanes, may be appropriate in a densely populated urban area with a significant commuting population, whereas HOV lanes may not be appropriate in a less densely populated suburban county.

In any case, the State or local agency will have the initial responsibility for demonstrating to EPA that the area has adopted all reasonably available measures so that the area will achieve RFP and attain the standards as expeditiously as practicable, in accordance with applicable policy and guidance for attainment demonstrations and modeling. In reviewing the State's selection of measures for RACM, or determination that certain measures are not RACM, EPA may supplement the rationale of the State or provide an alternative reason for reaching the same conclusion as the State, where appropriate.

In the past under other SIP programs, there have been instances where a State proposed to reject a single measure under consideration as RACM because the emission reduction benefits from that measure alone would not advance the attainment date by one year. The EPA does not believe this approach is appropriate under section 172. In the past, EPA has historically interpreted the RACM requirement as requiring the collective evaluation of measures and the assessment of whether they will advance the attainment date when taken together. EPA believes this approach is appropriate for implementing the PM<sub>2.5</sub> program.

In a RACM assessment, the State should not reject an individual measure unless the State can show that it has evaluated the collective effect of that measure plus all other available control measures to determine whether implementing those measures together would advance the attainment date. The

State's analysis should provide a reasoned justification for rejecting any available control measures. The supporting information must show why each rejected measure, including any measure raised as part of the State's public hearing or public comment process, is infeasible or unreasonable, or will not contribute to advancing attainment by one year.

If, for example, a State determines that there are six available control measures that are technically and economically feasible, yet when implemented together they would not contribute to RFP or advance the attainment date, then the state would not be required to adopt the measures as RACM. On the other hand, suppose a State determines that there are ten available control measures that are technically and economically feasible and collectively these measures would advance the attainment date by more than a year but less than two years. If the State determines that the collective implementation of only seven of the measures would still advance the attainment date by at least one year, then the state only would be required to adopt the seven measures and not all ten.

EPA emphasizes the importance for States to provide credible and thorough RACM analyses as part of their SIP demonstrations, complete with adequate supporting information and rationale supporting the State's inclusion or rejection of control measures. Recent experience with other SIP programs has shown that members of the public may bring legal challenges against the State if the State fails to provide an adequate technical analysis and supporting information for RACM. We believe it is essential that the public have the benefit of reviewing credible State RACM analyses in order to be sure that emissions reductions will be achieved expeditiously and all requirements for RFP and timely attainment will be achieved.

In the CAIR rulemaking (May 12, 2005 (70 FR at 25221 *et seq.*)), EPA found that the control installations projected to result from the CAIR NO<sub>x</sub> and SO<sub>2</sub> caps in 2009 and 2010 would be as much as feasible from EGUs across the CAIR region by those dates. EPA concluded that the CAIR compliance dates represent an aggressive schedule that reflects the limitations of the labor pool, and equipment/vendor availability, and need for electrical generation reliability for installation of emission controls. States should recognize these constraints in developing their own compliance schedules for emission controls in meeting their CAIR and

RACT responsibilities. However, the CAIR trading program did not specify which sources should install emissions control equipment or reduce emissions rates to a specific level in order to meet the SO<sub>2</sub> and NO<sub>x</sub> caps under CAIR.

Based on our experience developing the NO<sub>x</sub> SIP call, CAIR, and the proposed Clear Skies legislation, we believe that many power companies will develop their strategies for complying with CAIR based, in part, on consultations with air quality officials in the areas in which their plants are located. Because power plants are generally major emission sources, the operators of those plants typically have ongoing relationships with state and local officials that will be involved in developing air quality plans. We are aware that, in the past, companies have worked with air quality officials to meet their emission control obligations under a cap-and-trade approach such as the NO<sub>x</sub> SIP call while also addressing the concerns of air quality officials about the air quality impacts of specific plants. This has led to controlling emissions from power plants located in or near specific ozone nonattainment areas. A number of companies have indicated that such collaboration will be even more important as the States where they are located address multiple air quality goals (e.g., visibility, interstate air pollution, local attainment).

EPA expects similar consultations between States and power sector companies on the location of plants to be controlled under CAIR, considering local PM<sub>2.5</sub> and ozone attainment needs in planning for CAIR compliance. This consultation might reveal opportunities to provide improved air quality earlier for large numbers of people. Power companies may identify economic advantages in siting CAIR controls to help the local area attain; for example, it might need to control fewer facilities for the area to reach attainment. These benefits may outweigh any additional marginal costs the company might incur by forgoing controls on another more distant plant. In any event, the intent of these consultations would not be to upset market behavior or incentives. Rather, we anticipate that these consultations will affect individual control decisions for certain PM<sub>2.5</sub> areas. In this regard, EPA notes that CAIR SIPs will be due in 2006, while local attainment plans are proposed to be due in April 2008. EPA suggests that consultations on location of CAIR controls would be timely during state development of the CAIR SIP.

15. What factors should States consider in determining whether control measures are reasonably available?

Once the State has identified measures that are available for implementation in the nonattainment area, then it must evaluate those measures to determine whether implementation of such measures would be technically and economically feasible, and would collectively advance attainment. Many of the factors that the State should take into consideration in determining technical and economic feasibility are described earlier in sections 6 and 7 for RACT. Since RACM applies to area and mobile sources as well as stationary sources, the State should consider other factors as well in conducting its RACM analysis. For example, in many cases obtaining emissions reductions from area and mobile sources is achieved not by adding control technology to a specific emissions source, but by reducing the level of activity of a fleet of vehicles or by modifying a type of commercial process. In these situations, the State should also consider issues such as the social acceptability of the measure; local circumstances such as infrastructure, population, or workforce; and the time needed to implement the measure in light of the attainment date.

In regard to economic feasibility, EPA is not proposing a fixed dollar per ton cost threshold for RACM, just as it is not doing so for RACT. We believe that what is considered to be a reasonable emission reduction level can vary based on the severity of the nonattainment problem in the area and existing control measures in place. Where the severity of the nonattainment problem makes reductions more imperative or where essential reductions are more difficult to achieve, the acceptable cost of achieving those reductions could increase. In addition, we believe that in determining what are economically feasible emission reduction levels, the State should also consider the collective health benefits that can be realized in the area due to projected improvements in air quality. Areas with more serious air quality problems typically will need to obtain greater levels of emissions reductions from local sources than areas with less serious problems, and it would be expected that their residents could realize greater health benefits from such reductions. For this reason, we believe that it will be reasonable and appropriate for areas with more serious air quality problems and higher design values to impose emission reduction requirements with generally higher costs per ton than the cost of emissions

reductions in areas with lower design values. In areas with existing control measures in place for the purpose of attaining the PM<sub>10</sub> standards, the RACM analysis should evaluate the cost-effectiveness of additional control measures beyond those already being implemented.

Some nonattainment areas with 2001–2003 design values relatively close to the standard may be able to demonstrate through existing modeling analyses that they are projected to attain the standard within five years of the date of designation, based on the implementation of existing federally enforceable national and State measures alone (e.g., CAIR, national mobile source measures such as Tier II standards).

EPA believes that while areas projected to attain within five years of designation as a result of existing national measures should still be required to conduct a RACM analysis, such areas may be able to conduct a limited RACM analysis that does not involve additional air quality modeling. A limited analysis of this type could involve the review of available reasonable measures, the estimation of potential emissions reductions, and the evaluation of the time needed to implement these measures. If the State could not achieve significant emissions reductions by the beginning of 2008 due to time needed to implement reasonable measures or other factors, then it could be concluded that reasonably available local measures would not advance the attainment date. In lieu of conducting air quality modeling to assess the impact of potential RACM measures, existing modeling information could be considered in determining the magnitude of emissions reductions that could significantly affect air quality and potentially result in earlier attainment. If the State, in consultation with EPA, determines from this initial, more limited RACM analysis that the area may be able to advance its attainment date through implementation of reasonable measures, then the State must conduct a more detailed RACM analysis, involving air quality modeling analyses, to assess whether it can advance the attainment date.

16. What specific source categories and control measures should a State evaluate when determining RACM for a nonattainment area?

Section 172 does not provide a specific list of source categories and control measures that must be evaluated for RACM for PM<sub>2.5</sub>. In order to provide further guidance to States in the form of a starting list of source categories to

consider in a RACM analysis, we reviewed 2001 national emission inventory information for the more than 200 counties comprising PM<sub>2.5</sub> nonattainment areas. We have identified the detailed stationary, mobile, and area source categories that are major contributors to total emissions of PM<sub>2.5</sub> and its precursors in these counties.<sup>85</sup> Based on our review of this emission inventory data and air quality monitoring data from the speciation trends network, we recognize that a wide variety of source categories contribute to PM<sub>2.5</sub> concentrations in nonattainment areas across the country. We have also reviewed a wide variety of information sources to identify available control measures for many of these categories. Based on this analysis, a list of potential RACM measures is included at the end of this section.

Emission reduction measures constituting RACM should be determined on an area-by-area basis. We believe that a State should consider each of the measures listed in this section to determine if each measure is reasonably available in the applicable nonattainment area. However, under current EPA policy we do not presume that each of these measures is reasonably available in each nonattainment area.

We propose that each State use the list of source categories in this section as a starting point for identifying potentially available control strategies for a nonattainment area. States are encouraged and expected to add other potentially available measures to the list based on its knowledge of the particular universe of emissions sources in the area and comments from the general public. We expect that, depending on the potential measure being analyzed, the State's degree of evaluation will vary as appropriate.

#### Stationary Source Measures

- Stationary diesel engine retrofit, rebuild or replacement, with catalyzed particle filter
- New or upgraded emission control requirements for direct PM<sub>2.5</sub> emissions at stationary sources (*e.g.*, installation or improved performance of control devices such as a baghouse or electrostatic precipitator; revised opacity standard; improved compliance monitoring methods)
- New or upgraded emission controls for PM<sub>2.5</sub> precursors at stationary sources (*e.g.*, SO<sub>2</sub> controls such as wet

or dry scrubbers, or reduced sulfur content in fuel)

- Energy efficiency measures to reduce fuel consumption and associated pollutant emissions (either from local sources or distant power providers)
- #### Mobile Source Measures
- Onroad diesel engine retrofits for school buses<sup>86</sup> and trucks using EPA-verified technologies
  - Nonroad diesel engine retrofit, rebuild or replacement, with catalyzed particle filter<sup>87</sup>
  - Diesel idling programs for trucks, locomotive, and other mobile sources<sup>88</sup>
  - Transportation control measures (including those listed in section 108(f) of the CAA as well as other TCMs), as well as other transportation demand management and transportation systems management strategies<sup>89</sup>
  - Programs to reduce emissions or accelerate retirement of high emitting vehicles, boats, and lawn and garden equipment
  - Emissions testing and repair/maintenance programs for onroad vehicles
  - Emissions testing and repair/maintenance programs for nonroad heavy-duty vehicles and equipment<sup>90</sup>
  - Programs to expand use of clean burning fuels
  - Prohibitions on the sale and use of diesel fuel that exceeds a high sulfur content
  - Low emissions specifications for equipment or fuel used for large construction contracts, industrial facilities, ship yards, airports, and public or private vehicle fleets
  - Opacity or other emissions standards for “gross-emitting” diesel equipment or vessels
  - Reduce dust from paved and unpaved roads

#### Area Source Measures

- New open burning regulations and/or measures to improve program effectiveness

<sup>86</sup> See Clean School Bus USA program at <http://www.epa.gov/cleanschoolbus/>. See also: “What You Should Know About Diesel Exhaust and School Bus Idling”, (June 2003, EPA420-F-03-021) at <http://www.epa.gov/otaq/retrofit/documents/f03021.pdf>.

<sup>87</sup> See EPA's voluntary diesel retrofit program web site at <http://www.epa.gov/otaq/retrofit/overfleetowner.htm>.

<sup>88</sup> See EPA's voluntary diesel retrofit program web site at <http://www.epa.gov/otaq/retrofit/idling.htm>.

<sup>89</sup> See EPA's website on transportation control measures at <http://www.epa.gov/otaq/transp/traqtcms.htm>.

<sup>90</sup> See EPA's web site on nonroad engines, equipment, and vehicles at <http://www.epa.gov/otaq/nonroad.htm>.

- Smoke management programs to minimize emissions from forest and agricultural burning activities
- Programs to reduce emissions from woodstoves and fireplaces
- Controls on emissions from charbroiling or other commercial cooking operations
- Reduced solvent usage or solvent substitution (particularly for organic compounds with 7 carbon atoms or more, such as toluene, xylene, and trimethyl benzene)
- Reduce dust from construction activities and vacant disturbed areas

We request comment on the specific sources and potential control measures recommended for RACM analysis on this list. Commenters supporting the inclusion or exclusion of measures for this list should provide detailed supporting information as part of their comments.

17. What criteria should be met to ensure effective regulations or permits to implement RACT and RACM?

After the State has identified a RACT or RACM measure for a particular nonattainment area, it must then implement that measure through a legally enforceable mechanism (*e.g.*, such as a regulation or a permit provision). The regulation or permit provision should meet four important criteria.

First, the baseline emissions from the source or group of sources and the future year projected emissions should be quantifiable so that the projected emissions reductions from the sources can be attributed to the specific measures being implemented. It is important that the emissions from the source category in question are accurately represented in the baseline inventory so that emissions reductions are properly calculated. In particular, it is especially important to ensure that both the filterable and condensable components of PM<sub>2.5</sub> are accurately represented in the baseline since traditional Federal and State test methods have not included the condensable component of particulate matter emissions and have not required particle sizing of the filterable component.

Second, the control measures must be enforceable. This means that they must specify clear, unambiguous, and measurable requirements. When feasible, the measurable requirements for larger emitting facilities should include periodic source testing to establish the capability of such facilities to achieve the required emission level. Additionally, to verify the continued performance of the control measure,

<sup>85</sup> “Emission inventory analysis for 39 PM<sub>2.5</sub> Nonattainment Areas,” memo by Richard Damberg to docket OAR-2003-0062.

specific monitoring programs appropriate for the type of control measure employed and the level of emissions must be included to verify the continued performance of the control measure. The control measures and monitoring program must also have been adopted according to proper legal procedures.

Third, the measures should be replicable. This means that where a rule contains procedures for interpreting, changing, or determining compliance with the rule, the procedures are sufficiently specific and nonsubjective so that two independent entities applying the procedures would obtain the same result.

Fourth, the control measures should be accountable. This means, for example, that source-specific emission limits should be permanent and must reflect the assumptions used in the SIP demonstration. It also means that the SIP must contain a mechanism (such as a title V operating permit) to track emission changes at sources and provide for corrective action if emissions reductions are not achieved according to the plan.

*J. What guidance is available to States and Tribes for implementing innovative programs to address the PM<sub>2.5</sub> problem?*

EPA recognizes that, in order to address their fine particle problems, States, Tribes, and local agencies may need to approach certain categories of contributing emissions sources in non-traditional and innovative ways. EPA has developed several guidance documents on innovative programs and policies that may be useful to States and Tribes in developing implementation plans for attaining the PM<sub>2.5</sub> standards, and these are available at <http://www.epa.gov/ttn/airinnovations/policy.html>.

Many of these guidance documents and policies provide information on approaches that could be used for achieving reductions in emissions of PM<sub>2.5</sub> and its precursors. In 2001, EPA released guidance on the development and implementation of nontraditional measures. This guidance, entitled "Improving Air Quality with Economic Incentive Programs," provides factors to use to select the right emissions control program, as well as guidance on writing nontraditional regulations that can be approved into a SIP.

EPA has also developed policy documents that provide guidance on attaining credit in SIPs for voluntary measures which reduce emissions from

stationary sources<sup>91</sup> and from mobile sources.<sup>92</sup> Current SIP policy requires that, in order for an emission reduction measure to be approved, the emissions reductions must be quantifiable, surplus to other program requirements, enforceable, and permanent. These "voluntary measures" policies address situations in which reductions will be achieved despite the lack of any directly enforceable requirement on the sources of emissions. Under these policies, the State would receive credit toward its SIP obligations, and it would be responsible for assuring that the emissions reductions credited in the SIP actually occur. The State would make an enforceable commitment to monitor, assess and report on the emissions reductions resulting from the voluntary measures, and to remedy any shortfalls from forecasted emissions reductions in a timely manner. An example of stationary source measures that could be considered under this policy are no-burn days for wood stoves, voluntary woodstove change-out programs, or energy conservation programs. Examples of voluntary mobile source measures include ozone action plans, reduced switchboard locomotive idling, and trip reduction strategies.

The emerging and voluntary measures policy also addresses situations where quantification of projected emissions reductions from certain measures may be difficult to assess. The policy enables a State to receive provisional credit for implementing hard-to-quantify measures and sets forth procedures by which the State should evaluate program effectiveness.

Request for Comment on the Integrated Local Emission Reduction Program Concept. While significant environmental gains will be achieved through the Title IV SO<sub>2</sub> Acid Rain Program, the NO<sub>x</sub> SIP Call Program, the Mobile Source Control Program, and future implementation of the Clean Air Interstate Rule (CAIR), they are not designed to solve every nonattainment problem. Residual nonattainment areas will continue to exist after implementation of these programs, and

<sup>91</sup> "Incorporating Emerging and Voluntary Measures in a State Implementation Plan," EPA Office of Air Quality Planning and Standards, Air Quality Strategies and Standards Division, Research Triangle Park, NC, September 2004. For further information, see: [http://www.epa.gov/ttn/oarpg/t1/memoranda/evm\\_ievm\\_g.pdf](http://www.epa.gov/ttn/oarpg/t1/memoranda/evm_ievm_g.pdf).

<sup>92</sup> "Guidance on Incorporating Voluntary Mobile Source Emission Reduction Programs in State Implementation Plans (SIPs)," memorandum from Richard D. Wilson, Acting Assistant Administrator for Air and Radiation, to EPA Regional Administrators, October 24, 1997. For further information, see <http://www.epa.gov/otaq/transp/vmweb/vmpdoc.htm>.

EPA believes that it may be useful to provide incentives that would stimulate innovative programs to focus additional emission reduction efforts designed to help bring these remaining nonattainment areas into attainment.

In particular, it may be useful to provide real incentives for the emissions-generating community to help design additional approaches on their own initiative that could achieve further environmental benefits outside of the sources and emissions subject to these rules.

EPA is interested in ideas that could create a system which satisfies regional reduction obligations through targeted reduction strategies for designated nonattainment areas. These ideas and incentives could be designed and administered by individual States, or groups of States to be incorporated as part of their State and local attainment planning process for developing SIPs. We believe that, for any such program to be successful, it would need to balance accountability and flexibility, as well as respond to the needs and concerns of air pollution control agencies and regulated sources.

To support the concept of the ILERP, EPA solicits comment on the development and application of factors or criteria for the States and the emissions-generating community that would take into account the unique needs of specific nonattainment areas. We also seek comment on approaches that would provide incentives for improved monitoring and characterization of emissions, e.g., using different factors based on the technical rigor and reliability of emissions verification methods.

Potential mechanisms could range from basic financial incentives to more aggressive and innovative approaches. In its simplest form, the emissions-generating community could choose to complement or expand existing control measures, or perhaps fund new ones. Under the latter approach, a specific value could be applied to a ton of local emissions to be reduced depending on one or more specific criteria such as: The accuracy and technical validity of emissions monitoring used to characterize emissions or demonstrate compliance, seasonal timing or location of the reductions, population exposure, or other considerations.

For example, reducing PM<sub>2.5</sub> from a sector in a nonattainment area might receive a greater value than reductions from a sector that is upwind of the nonattainment area most of the year, due to the relative effectiveness of the measures at reducing population exposure and monitoring of PM<sub>2.5</sub>.



Another example could be one in which the emissions-generating facility receives an incentive in exchange for reductions in other pollutants causing PM<sub>2.5</sub>, based on using technically appropriate air quality models to demonstrate superior environmental results.

We seek comment, consistent with the philosophy of State implementation planning, on various approaches that could incorporate these ideas to allow the States to implement such a program that would result in greater emissions reductions and greater environmental results beyond the reductions achieved by the aforementioned existing programs.

*K. What aspects of transportation conformity and the PM<sub>2.5</sub> standard are addressed in this proposal?*

1. What is transportation conformity?

Transportation conformity is required under section 176(c) of the CAA (42 U.S.C. 7506(c)) to ensure that federally supported highway and transit project activities are consistent with (“conform to”) the purpose of a SIP. Conformity to the purpose of the SIP means that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. Transportation conformity applies in nonattainment areas and maintenance areas. The EPA’s transportation conformity rule, 40 CFR part 93, establishes the criteria and procedures for determining whether transportation activities conform to the State air quality plan. It also establishes criteria and procedures for determining whether transportation activities conform in areas where no SIP containing mobile source emissions budgets yet exists.

EPA first published the transportation conformity rule on November 24, 1993 (58 FR 62188) and has amended the rule several times. On August 15, 1997, a comprehensive set of amendments was published that clarified and streamlined language from the 1993 transportation conformity rule (62 FR 43780). On July 1, 2004 the rule was amended to address conformity requirements in 8-hour ozone and PM<sub>2.5</sub> nonattainment and maintenance areas (69 FR 40004). The July 1, 2004 final rule also incorporated revisions related to a March 1999 court decision and further clarified and streamlined language in the previous version of the rule. On May 6, 2005, EPA finalized a rule on requirements for addressing PM<sub>2.5</sub> precursors in transportation conformity determinations (70 FR 24280). These rulemakings, as well as other relevant

conformity materials such as guidance documents, policy memoranda, the complete text of the conformity rule, and conformity research can be found at EPA’s transportation conformity Web site, at <http://www.epa.gov/otaq/transp.htm> (once at the site, click on “Transportation Conformity.”)

2. Why does transportation conformity apply to PM<sub>2.5</sub>?

Transportation conformity will apply to PM<sub>2.5</sub> because EPA has evidence to indicate that motor vehicle emissions are significant contributors to the air quality problem in most, if not all, PM<sub>2.5</sub> nonattainment areas. Gasoline and diesel vehicles emit fine particulate matter as well as PM<sub>2.5</sub> precursors such as volatile organic compounds (VOCs), NO<sub>x</sub>, sulfur oxides (SO<sub>2</sub>) and ammonia (NH<sub>3</sub>). Travel on paved and unpaved roads results in re-entrained road dust which may contribute to measured PM<sub>2.5</sub> violations. Also, in some areas transportation-related construction activities may also result in the creation of significant amounts of dust.

3. Why is EPA discussing transportation conformity in this proposal?

We are not proposing changes to the transportation conformity rule in today’s proposal. Instead, we are discussing transportation conformity in this notice in order to provide affected parties with information on when transportation conformity will be implemented under the PM<sub>2.5</sub> standard. Affected parties may include State and local transportation and air quality agencies, metropolitan planning organizations (MPOs) and the U.S. Department of Transportation (DOT). To determine whether this discussion affects your organization, you should carefully examine the applicability requirements in 40 CFR 93.102 of the transportation conformity rule.

4. What revisions have been made to the transportation conformity rule to address the PM<sub>2.5</sub> standard?

The July 1, 2004, transportation conformity rule revisions contain a number of provisions that apply to PM<sub>2.5</sub> nonattainment and maintenance areas. For example, the July 1, 2004, rule contains requirements for: regional conformity tests in PM<sub>2.5</sub> areas; considering direct emissions of PM<sub>2.5</sub> (i.e., exhaust, brake and tire wear and re-entrained dust) in regional emissions analyses; considering re-entrained road dust and construction-related fugitive dust in regional emissions analyses and compliance with PM<sub>2.5</sub> SIP control measures.

In addition to the July 1, 2004 rule, EPA published a final rule on May 6, 2005 (70 FR 24280) that established requirements for addressing PM<sub>2.5</sub> precursors in regional emissions analyses. EPA also published a supplemental notice of proposed rulemaking<sup>93</sup> requesting comment on a number of options for consideration of localized emissions impacts of individual transportation projects in PM<sub>2.5</sub> nonattainment and maintenance areas. We intend to finalize requirements for localized emissions analyses in PM<sub>2.5</sub> nonattainment and maintenance areas as expeditiously as possible.

5. Does EPA plan to revoke the PM<sub>10</sub> standard?

No, we are not planning to revoke the PM<sub>10</sub> standards at this time. We are in the process of reviewing the PM NAAQS, and as part of that process we are considering whether the current scientific literature would support the establishment of coarse particle standards. (Coarse particles are those which have an aerodynamic diameter between 2.5 and 10 micrometers.)

6. Will some areas be demonstrating conformity for both PM<sub>10</sub> and PM<sub>2.5</sub> at the same time?

Yes, since the PM<sub>10</sub> standard is being retained, a small number of areas will be required to determine conformity to both air quality standards. PM<sub>10</sub> nonattainment and maintenance areas should continue to make PM<sub>10</sub> conformity determinations according to the conformity regulation. By the end of the one-year grace period, conformity of metropolitan plans and transportation improvement programs (TIPs) must be determined, reflecting the metropolitan area and any associated donut areas (defined below).

7. When does transportation conformity apply to PM<sub>2.5</sub> nonattainment areas?

Transportation conformity applies to PM<sub>2.5</sub> nonattainment areas one year after the effective date of an area’s designation. This one-year grace period is found in the CAA at 42 U.S.C. 7506(c)(6). Specifically, this section of the CAA provides areas, when they are first designated nonattainment for a given air quality standard, with a one-year grace period before the conformity regulation applies with respect to that standard. Since the PM<sub>2.5</sub> standard is a different standard from the PM<sub>10</sub> standard, every area that is designated nonattainment for the PM<sub>2.5</sub> standard will have a one-year grace period before

<sup>93</sup> 69 FR 72140 (December 13, 2004).

conformity applies for the PM<sub>2.5</sub> standard, regardless of whether conformity applies in the area for the PM<sub>10</sub> standard.

For more information, please see the proposed and final rulemaking entitled, "Transportation Conformity Rule Amendments: Minor Revision of 18-Month Requirement for Initial SIP Submissions and Addition of Grace Period for Newly Designated Nonattainment Areas," published October 5, 2001, (66 FR 50954), and August 6, 2002, (67 FR 50808), respectively for additional discussion of the one-year grace period for newly designated areas. (The proposed and final rule can be found on EPA's transportation conformity website mentioned above.)

8. How does the 1-year grace period apply in metropolitan areas?

A one-year grace period for implementation of the conformity program applies in metropolitan areas that have an established metropolitan planning organization (MPO) that is responsible for transportation planning per 23 U.S.C. 134. In these areas, the one-year grace period means that, one year after the effective date of an area's designation as nonattainment for the PM<sub>2.5</sub> standard, the area must have a conforming transportation plan and transportation improvement program (TIP)<sup>94</sup> in place to fund or approve transportation projects. (For the discussion of which projects can proceed after the end of the grace period if a conformity determination has not been made by the MPO and U.S. DOT, please see the July 1, 2004 final rule (69 FR 40037), DOT's January 2, 2002, guidance, published February 7, 2002, at 67 FR 5882; and EPA's May 14, 1999, conformity guidance. All of these documents can be found on EPA's transportation conformity Web site.)

9. How does the 1-year grace period apply in "donut" areas?

For the purposes of conformity, a donut area is the geographic area outside a metropolitan planning area boundary, but inside the boundary of a designated nonattainment/maintenance area. The conformity requirements for donut areas are generally the same as those for metropolitan areas, and the MPO would include any projects occurring in the donut area in its analysis of the metropolitan transportation plan and TIP. A donut

area is not an isolated rural area for the purposes of the conformity process. Therefore, the one-year grace period applies to donut areas in much the same way that it applies to metropolitan areas. That is, within one year of the effective date of an area's designation, a donut area's projects must be included in an MPO's conformity determination for the metropolitan plan and TIP for those projects to be funded or approved. If, at the conclusion of the one-year grace period, the donut area's projects have not been included in the MPO's conformity determination, new "nonexempt" projects and project phases could not be approved in the metropolitan area or the donut area.

10. How does the 1-year grace period apply in isolated rural areas?

For the purposes of conformity, isolated rural nonattainment and maintenance areas are areas that do not contain or are not part of any metropolitan planning area designated under the transportation planning regulations. Isolated rural areas do not have federally required metropolitan transportation plans or TIPs and do not have projects that are part of the emissions analysis of any MPO's transportation plan or TIP. Isolated rural areas are distinguished from "donut" areas which are geographic areas outside a metropolitan planning area boundary, but inside the boundary of a nonattainment or CAA section 175A maintenance plan area that is dominated by a metropolitan area(s).

Because isolated rural areas do not have federally required metropolitan transportation plans and TIPs, a conformity determination need only be done in an isolated rural area when that area has a transportation project or projects that need approval. Therefore, isolated rural areas also have a one-year grace period before conformity applies under the PM<sub>2.5</sub> standard, but at the end of that grace period, the area does not have to have made a conformity determination. An isolated rural area would be required to do conformity only at the point when a new transportation project needs approval. This point may occur significantly after the one-year grace period has ended. (Conformity requirements for isolated rural areas can be found at 40 CFR 93.109(g).)

*L. What requirements for general conformity should apply to the PM<sub>2.5</sub> standards?*

1. What is the purpose of the general conformity regulations?

Section 176(c) of the CAA requires that before a Federal entity takes an action, it must make a determination that the proposed action will not interfere with the SIP or the State's ability to attain and maintain the NAAQS. In November 1993, EPA promulgated two sets of regulations to implement section 176(c). One set, known as the Transportation Conformity Regulations (described above) deals with approval and funding of highway and mass transit project. The other set, known as the general conformity regulations, deals with all other Federal activities. Besides ensuring that Federal actions will not interfere with the SIP, the general conformity program also fosters communications with State/local air quality agencies, allows for public participation in the review of air quality impacts from Federal actions, and allows for air quality review of individual projects. In 1995, Congress limited the application of section 176(c) to nonattainment and maintenance areas only.

2. How is the general conformity program currently structured?

Due to the very broad definition of "Federal action" in the statute and the number of Federal agencies subject to the conformity requirement, the number of individual conformity decisions could have been on the order of a thousand or more per day. To avoid creating an unreasonable administrative burden, EPA established *de minimis* emissions levels and exempted certain actions. In addition, the regulations allow Federal agencies to develop their own list of actions which are presumed to conform. For non-exempt actions that increase emissions above the *de minimis* levels, the Federal agency must demonstrate that the action will conform with the SIP or will not cause or contribute to any new violation of any standard in any area; interfere with provisions in the applicable SIP for maintenance of any standard; increase the frequency or severity of any existing violation of any standard; or delay timely attainment of any standard or any required interim emissions reductions or other milestone. We are currently reviewing the general conformity program and, in a separate action, may revise the regulations as appropriate, with respect to the PM<sub>2.5</sub> standards.

<sup>94</sup> When used only in this section on transportation conformity, the acronym "TIP" refers to "transportation improvement program." In all other sections of this preamble, the acronym "TIP" stands for "tribal implementation plan."

### 3. Who runs the general conformity program?

Each Federal agency is responsible for determining if the action it takes is subject to the conformity regulations and, if so, whether the action conforms to the SIP. Each Federal agency's approach to the conformity evaluation differs depending upon the actions being taken. Agencies that permit or fund actions subject to the conformity rules generally require the applicant to develop the technical support for the conformity determination, although some agencies undertake the complete evaluation themselves.

### 4. How does an agency demonstrate conformity?

Depending upon the pollutant and the specific situation, Federal agencies have several options for demonstrating conformity. For actions in PM<sub>2.5</sub> nonattainment and maintenance areas, the Federal agency can demonstrate that the project/action is specifically identified and accounted for in the SIP, obtain documentation from the State that the emissions are included in the SIP, have the State commit to include the emissions in the SIP, or mitigate the emissions or offset the emissions from emissions reductions within the same nonattainment or maintenance area.

### 5. General Conformity Regulation Revisions for the PM<sub>2.5</sub> Standards

#### a. What *de minimis* emission levels will be set for pollutants that contribute to PM<sub>2.5</sub> concentrations?

As discussed in the technical overview section, the key pollutants contributing to PM<sub>2.5</sub> concentrations in the atmosphere are direct PM<sub>2.5</sub> emissions, SO<sub>2</sub>, NO<sub>x</sub>, VOC, and ammonia. Section II.E. proposes policy options for addressing each of these precursors under the PM<sub>2.5</sub> implementation program. After consideration of public comment, EPA will finalize precursor requirements for the PM<sub>2.5</sub> implementation program. When finalized, these precursor requirements will also apply under the general conformity program.

In another rulemaking action, we will propose to establish *de minimis* emission levels for federal projects or actions covered by the general conformity program. It is expected that the proposed levels will be identical to the nonattainment area major source levels for the NSR program. Under this approach, PM<sub>2.5</sub> nonattainment areas would have *de minimis* emission levels for general conformity purposes of 100 tons per year for all PM<sub>2.5</sub> pollutants. These levels are also consistent with the

levels proposed for VOC and NO<sub>x</sub> emissions in subpart 1 areas under the 8-hour ozone implementation strategy.<sup>95</sup>

#### b. What impact will the implementation of the PM<sub>2.5</sub> standards have on a State's general conformity SIP?

Since we are not now proposing to make specific revisions to the general conformity regulations in this proposal, States should not need to revise their general conformity SIPs, unless they need to do so to ensure the regulations apply in the appropriate areas.

#### c. Are there any other impacts on the SIPs related to general conformity based on implementation of the PM<sub>2.5</sub> standards?

Currently, we are developing a revision to the general conformity regulations through a separate rulemaking action, but we are not proposing any general conformity revisions in today's action. However, as areas develop SIPs for the PM<sub>2.5</sub> standards, we recommend that State and local air quality agencies work with major facilities which are subject to the general conformity regulations (e.g., commercial airports and large military bases) to establish an emission budget for each facility in order to facilitate future conformity determinations. Such a budget could be used by Federal agencies in determining conformity or identifying mitigation measures.

#### 6. Is there a 1-year grace period which applies to general conformity determinations for the purposes of the PM<sub>2.5</sub> standards?

Yes, the 1-year grace period for implementation of conformity requirements after area designations are completed applies to both transportation and general conformity.<sup>96</sup> Therefore, the general conformity requirements would not apply to federal actions or projects in newly designated nonattainment areas until 1 year after the effective date of the PM<sub>2.5</sub> area designation. The effective date of the PM<sub>2.5</sub> designations was April 2005. Thus, general conformity requirements would apply in April 2006. As discussed earlier, the PM<sub>2.5</sub> standards are new and the grace period applies to all the areas designated nonattainment for that standard. The general conformity regulations specify requirements for actions/projects in areas without an approved SIP. Those requirements would apply to PM<sub>2.5</sub>

nonattainment areas until the SIP is approved by EPA.

#### M. How will the NSR program address PM<sub>2.5</sub> and its precursors?

##### 1. Background

The existing regulations require both major and minor New Source Review (NSR) programs to address any pollutant for which there is a national ambient air quality standard (NAAQS) and any precursors to the formation of that pollutant when identified for regulation by the Administrator. We are proposing to amend the NSR regulations to clarify how States, local agencies and Tribes must implement NSR for the PM<sub>2.5</sub> standard. This proposal also explains how the existing rules will be implemented with respect to PM<sub>2.5</sub> during the State Implementation Plan (SIP) development period.

The NSR program is a preconstruction permitting program that applies when a source is constructed or modified. The NSR program is composed of three different programs:

- Prevention of Significant Deterioration (PSD);
- Nonattainment NSR (NA NSR); and,
- Minor NSR.

We often refer to the PSD and Nonattainment NSR program as the major NSR program because these programs regulate only major sources.<sup>97</sup>

The PSD program applies when a major source, that is located in an area that is designated as attainment or unclassifiable for any criteria pollutant, is constructed or undergoes a major modification.<sup>98</sup> The NA NSR program applies when a major source that is located in an area that is designated as nonattainment for any criteria pollutant is constructed or undergoes a major modification. The minor NSR program addresses both major and minor sources that undertake construction or modification activities that do not qualify as major, and it applies regardless of the designation of the area in which a source is located.

The national regulations that apply to each of these programs are located in the Code of Federal Regulations (CFR) as shown below:

<sup>97</sup> The Act uses the terms "major emitting facility" to refer to sources subject to the PSD program, and "major stationary source" to refer to sources subject to Nonattainment NSR. CAA Sections 169 and 302(j). For ease of reference, we use the term "major source" to refer to both terms.

<sup>98</sup> In addition, the PSD program applies to most noncriteria regulated pollutants.

<sup>95</sup> See 68 FR 32843.

<sup>96</sup> See section 42 U.S.C. 7506(c)(6).

	Applicable regulations
PSD .....	40 CFR 52.21, 40 CFR 51.166, 40 CFR 51.165(b).
NA NSR .....	40 CFR 52.24, 40 CFR 51.165, 40 CFR Part 51, Appendix S.
Minor NSR	40 CFR 51.160–164.

The PSD requirements include but are not limited to:

- Installation of Best Available Control Technology (BACT),
  - Air quality monitoring and modeling analyses to ensure that a project's emissions will not cause or contribute to a violation of any NAAQS or maximum allowable pollutant increase (PSD increment),
  - Notification of Federal Land Manager of nearby Class I areas, and
  - Public comment on the permit.
- Nonattainment NSR requirements include but are not limited to:

- Installation of Lowest Achievable Emissions Rate (LAER) control technology,
  - Offsetting new emissions with creditable emissions reductions,
  - Certification that all major sources owned and operated in the State by the same owner are in compliance with all applicable requirements under the Act,
  - An alternative siting analysis demonstrating that the benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification,
  - Public comment on the permit.
- Minor NSR programs must meet the statutory requirements in Section 110(a)(2)(c) of the Act which requires “\* \* \* regulation of the modification and construction of any stationary source\* \* \* as necessary to assure that the [NAAQS] are achieved.”

This proposed rule on the implementation of NSR for PM<sub>2.5</sub> does not supersede existing PM<sub>10</sub> NSR requirements. EPA is not planning to revoke the original PM<sub>10</sub> standards at this time. Accordingly, sources are subject to NSR for both PM<sub>10</sub> and PM<sub>2.5</sub>.

2. What are the principal elements of the proposed major NSR program for PM<sub>2.5</sub>?

The table below summarizes the main elements of the existing major NSR program that EPA is proposing to address for PM<sub>2.5</sub> as a regulated NSR pollutant. The EPA's proposal for each element, or where appropriate, explanation of implementation under existing regulations, is explained in detail in the referenced sections of this preamble.

Major NSR program element	EPA proposal	Section
PSD Major Source Threshold .....	100/250 TPY (no change) .....	IV.M.4.
NA NSR Major Source Threshold .....	100 TPY (no change) .....	IV.M.4.
Significant Emissions Rate .....	PM <sub>2.5</sub> Direct Emissions—10 TPY; SO <sub>2</sub> —40 TPY .....	IV.M.5 & 6.
	If other precursors are included: NO <sub>x</sub> —40 TPY (no change). VOC & Ammonia—determined by SIP.	
Control technology: BACT and LAER .....	Applies for PM <sub>2.5</sub> direct, SO <sub>2</sub> and other precursors, if included.	IV.M.9 & 13.
Air quality impact analysis .....	Applies for PM <sub>2.5</sub> .....	IV.M.11.
Preconstruction monitoring .....	Applies for PM <sub>2.5</sub> . Proposing five options to address. ....	IV.M.12.
NA NSR Statewide compliance .....	Applies for PM <sub>2.5</sub> direct and precursors, if included .....	IV.M.13.
NA NSR offsets .....	Applies for PM <sub>2.5</sub> direct .....	IV.M.14.
Interprecursor Offsetting .....	Considering for precursor emissions .....	
Transition for PSD .....	Allowed with modeling demonstration (no change) .....	IV.M.14.c.
	Continues to apply with limited provisions for use of PM <sub>10</sub> as a surrogate.	IV.M.16.
Transition for NA NSR .....	Applies at designation through an approved SIP or through 40 CFR part 51, appendix S.	IV.M.17.
Minor NSR .....	Clarifies that State and local regulatory programs must include PM <sub>2.5</sub> requirements for minor sources.	IV.M.20.
NSR Transport Option .....	Flexible implementation for areas granted a transport classification.	IV.M.21.

The proposed provisions of the PM<sub>2.5</sub> major NSR program will be codified in the regulatory text as revisions to 40 CFR 51.165; 51.166; 52.21; and 40 CFR part 51, Appendix S. We have made two assumptions in developing the proposed regulatory text for this rule.

The first assumption is that the ozone phase II rule will be promulgated prior to the promulgation of this proposed PM<sub>2.5</sub> rule. Thus, this proposed PM<sub>2.5</sub> rule includes language related to ozone precursors and offsets that make the format of the ozone rule consistent with the PM<sub>2.5</sub> language. The ozone provisions contained in the regulatory text set forth below are consistent with what we expect to finalize in the ozone rule, and this PM<sub>2.5</sub> proposal is not intended to alter the substance of the

ozone phase II rule. To the extent there are changes to the ozone phase II regulatory language when promulgated or the ozone rule is not promulgated prior to the final PM<sub>2.5</sub> rule, we would need to make changes to the proposed regulatory text in this PM<sub>2.5</sub> rule at promulgation.

The paragraphs in the revisions to appendix S of this proposed PM<sub>2.5</sub> rule have not been numbered at this time, based on the second assumption that both of the appendix S rule revisions, appendix S changes in the ozone phase II rule (incorporating the 1990 amendments) and the revisions to appendix S (incorporating NSR reform), will be promulgated prior to the final PM<sub>2.5</sub> rule. Depending on the status of these appendix S rule revisions at the

time of promulgation of the PM<sub>2.5</sub> rule, the paragraphs would be numbered accordingly.

3. Should precursors to the formation of ambient concentrations of PM<sub>2.5</sub> be subject to regulation under NSR?

a. Background

Certain NAAQS pollutants such as ozone and PM<sub>2.5</sub>, are partially or entirely formed by precursors. Precursors are currently regulated under parts C and D of the Act based on either statutory presumptions or a scientific determination that the pollutants must be regulated to achieve attainment. The following table shows precursors that we have identified for regulation under the NSR program because of their ability

to cause or contribute to violations of the ozone NAAQS.

Criteria pollutant	Precursor pollutants
Ozone: Nonattainment Areas ..... Attainment Areas .....	Volatile Organic Compounds (VOC) and Nitrogen Oxides (NO <sub>x</sub> ). VOC <sup>99</sup> .

Individual SIPs may identify additional precursors as regulated NSR pollutants.

Scientific research has shown that various pollutants can contribute to ambient PM<sub>2.5</sub> concentrations, including the following:

- PM<sub>2.5</sub> (direct emissions)
- SO<sub>2</sub> (as a precursor)
- NO<sub>x</sub> (as a precursor)
- VOC (as a precursor)
- Ammonia (as a precursor)

b. Should NSR cover precursor emissions in addition to direct emissions of PM<sub>2.5</sub>?

Contribution of precursors to PM<sub>2.5</sub> nonattainment. As discussed in Section II, precursors contribute significantly to ambient PM<sub>2.5</sub> concentrations, producing approximately half of the concentration. In most areas of the country, PM<sub>2.5</sub> precursor emissions are the major contributors to ambient PM<sub>2.5</sub> concentrations. However, it is

technically difficult to determine impacts of source-specific precursor emissions on ambient air quality levels. The relative contribution to ambient PM<sub>2.5</sub> concentrations from each of these pollutants varies by area. The relative effect of reducing emissions of these pollutants is also highly variable.

PM<sub>2.5</sub> precursors already addressed under NSR. Some PM<sub>2.5</sub> precursors are already subject to major NSR under other NAAQS as shown below:

PM <sub>2.5</sub> precursor .....	Existing Program coverage for major NSR applicability.
NO <sub>x</sub> .....	NA NSR for NO <sub>2</sub> and Ozone PSD for NO <sub>2</sub> .
SO <sub>2</sub> .....	NA NSR and PSD for SO <sub>2</sub> .
VOC .....	NA NSR and PSD for Ozone.
Ammonia .....	No coverage for NSR (Some areas regulate ammonia for other air quality purposes.)

The PM<sub>2.5</sub> NSR program could include some, all or none of these precursors of PM<sub>2.5</sub>.

Legal Authority. As discussed earlier in section II.E. of this preamble, we interpret the Clean Air Act to provide explicit authority for EPA to regulate precursors but also to grant the Administrator discretion to determine how to address precursors for particular regulatory purposes. This reading is based on section 302(g) of the Clean Air Act which defines the term “air pollutant” to include “any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term ‘air pollutant’ is used.” The Administrator’s discretion to determine how to address precursors under specific programs is also supported by the language in sections 182(f) and 189(e) which identifies circumstances where the Administrator may determine that it is not appropriate to regulate certain precursors. We discuss these provisions in more detail in section II.E.

Thus, we interpret section 302(g) of the Act to require that the Administrator consider how to address precursors under the NSR program. The term “air pollutant” is incorporated into the NSR provisions for various purposes. Sections 182(f) and 189(e) apply to State

implementation plan provisions and control requirements, which include NSR programs.

With regard to PSD, Section 165(a)(3) of the Act states that new or modified major sources must demonstrate that emissions “will not cause, or contribute to, air pollution in excess of any \* \* \* NAAQS in any air quality control region.” A source could not reasonably make this demonstration without considering precursors that the Agency has identified for this purpose. Section 165(a)(4) of the Act states that a new or modified source must apply the Best Available Control Technology (BACT) “for each pollutant subject to regulation under this Act emitted from, or which results from, such facility.” The phrase “emitted from, or which results from” indicates that the statute is not limited to direct emissions, but rather extends to precursors as well.

With regard to nonattainment NSR, Sections 172(c)(4) and 173 require States to demonstrate, among other things, that emissions from new or modified major sources are consistent with the achievement of “reasonable further progress.” Reasonable further progress is further defined as reductions of the relevant air pollutant, which is defined in Section 302(g) to include precursors identified by the Agency as subject to regulation for that purpose.

Treatment of Precursors for Purposes of NSR. As discussed in section II.E., where there is a basis to do so, we believe EPA may treat precursors of the same pollutant differently under the same program. In this action, we propose different approaches for addressing the individual precursors to PM<sub>2.5</sub> under the Act’s NSR provisions. Generally, where the scientific data and modeling analyses provide reasonable certainty that the pollutant’s emissions from stationary sources are a significant contributor to ambient PM<sub>2.5</sub> concentrations, we believe that pollutant should be identified as a “regulated NSR pollutant” and subject to the PM<sub>2.5</sub> NSR provisions. Conversely, where the effect of a pollutant’s emissions from stationary sources on ambient PM<sub>2.5</sub> concentrations is subject to substantial uncertainty, such that in some circumstances, the pollutant may not result in formation of PM<sub>2.5</sub>, or control of the pollutant may have no effect or may even aggravate air quality, we generally believe it is unreasonable to establish a nationally-applicable presumption that the pollutant is a regulated NSR pollutant subject to the requirements of NSR for PM<sub>2.5</sub>. We also request comment on whether, despite reasonable scientific certainty associated with the effect of a

<sup>99</sup> We have proposed to amend the PSD regulations to expressly include NO<sub>x</sub> as an ozone precursor. 68 FR 32802 (June 2, 2003).

pollutant's emissions from stationary sources on ambient PM<sub>2.5</sub> concentrations, there are circumstances that would support a finding that the Administrator should not identify the pollutant as a precursor for the purposes of the NSR program even if the pollutant is so identified for other programs.

For the purposes of the NSR program, the EPA proposes the following options for addressing SO<sub>2</sub>, NO<sub>x</sub>, VOCs, and ammonia as precursors to PM<sub>2.5</sub>, and requests comment on these options. Commenters should provide detailed technical information supporting their comments. Sulfur Dioxide. We are proposing to regulate SO<sub>2</sub> as a precursor to PM<sub>2.5</sub> for purposes of NSR in all attainment, unclassifiable and nonattainment areas. We believe that the technical discussion and analysis of speciated air quality data described in Section II provide an appropriate basis for requiring States to address SO<sub>2</sub> as a precursor to PM<sub>2.5</sub> for NSR purposes. The fact that sulfate is a significant contributor (e.g. ranging from 9 percent to 40 percent) to PM<sub>2.5</sub> nonattainment and other air quality problems in all regions of the country is a critical piece of evidence supporting this approach. Additionally, sulfates are a major contributor to ambient PM<sub>2.5</sub> concentrations in the Eastern United States, roughly equaling the concentration of carbonaceous particles.

EPA does not believe that regulating SO<sub>2</sub> as a precursor to PM<sub>2.5</sub> is likely to add a major burden to sources as SO<sub>2</sub> is already regulated in these programs as part of the NSR program for the SO<sub>2</sub> NAAQS. The EPA requests comments on this approach to regulate SO<sub>2</sub> as a precursor to PM<sub>2.5</sub> and a "regulated NSR pollutant" for purposes of NSR in all attainment, unclassifiable and nonattainment areas. Nitrogen Oxides. We are proposing to regulate NO<sub>x</sub> as a precursor to PM<sub>2.5</sub> for the NSR program. Under this approach, a State or EPA would presume that NO<sub>x</sub> is a significant contributor to an area's ambient PM<sub>2.5</sub> concentration. This presumption is warranted based on the well-known transformation of NO<sub>x</sub> into nitrates, as discussed in more detail in Section II. Nitrates are a significant component of PM<sub>2.5</sub> mass in northern regions, such as the Midwest and East Coast, and are a main contributor to urban PM<sub>2.5</sub> mass in California (35–40 percent). However, as described in Section II, nitrate concentrations vary significantly in other regions of the country.

Thus, a State could exempt NO<sub>x</sub> from its PM<sub>2.5</sub> NSR program in a specific area by demonstrating to the Administrator's satisfaction that NO<sub>x</sub> emissions from stationary sources in that area are not a

significant contributor to that area's ambient PM<sub>2.5</sub> concentrations and the area is not in a State identified by EPA as a source of a PM<sub>2.5</sub> interstate transport problem. Hence, for such an area, the State would not need to regulate construction and modification of stationary sources that increase emissions of NO<sub>x</sub> in that area to assure that these emissions do not interfere with reasonable further progress or the ability of that area to attain or maintain the PM<sub>2.5</sub> NAAQS. Otherwise, this option would make NO<sub>x</sub> a precursor for the PSD, NA NSR and minor source programs for PM<sub>2.5</sub>. EPA does not believe that this is likely to add a major burden to sources as NO<sub>x</sub> is already a regulated NSR pollutant. This is because NO<sub>x</sub> is an identified precursor for the ozone NAAQS and an indicator for the NO<sub>2</sub> NAAQS.

*Volatile Organic Compounds.* The consideration of VOC for NSR applicability is complicated by the variations in reactions of the different species of VOC in the atmospheric transformation into PM<sub>2.5</sub>. Scientific analysis demonstrates that, while the transformation of VOC into particles is a complex and uncertain process, all VOC potentially play a role in the formation of PM<sub>2.5</sub>. However some specific compounds play a more direct role than others. These transformations are discussed in Section II. In light of the complexity in assessing the role of VOC in PM<sub>2.5</sub> formation, we are not proposing to regulate VOC as a precursor to PM<sub>2.5</sub> for the NSR program.

However, if a State demonstrates to the Administrator's satisfaction that VOC emissions from stationary sources in a specific area are a significant contributor to that area's ambient PM<sub>2.5</sub> concentrations, then the State would regulate VOC (or a subset of VOC) as a PM<sub>2.5</sub> precursor for the NSR program in that area. Therefore, for such an area, the State would need to regulate construction and modification of stationary sources that increase emissions of VOC in that area to assure that these emissions do not interfere with reasonable further progress or the ability of that area to attain or maintain the PM<sub>2.5</sub> NAAQS. Under either scenario, as discussed in Section II, we would still regulate high molecular weight VOC (with 25 carbon atoms or more and low vapor pressure) as PM<sub>2.5</sub> direct emissions because they are emitted directly as primary organic particles and exist primarily in the condensed phase at ambient temperatures.

Ammonia. As discussed in section II.E., in some areas of the country, ammonia plays a significant role in the

formation of ambient PM<sub>2.5</sub> concentrations. In other areas, ammonia plays a less significant role. Our understanding of emissions inventories, and the impact that reducing ammonia emissions has on ambient PM<sub>2.5</sub> concentrations, is evolving. In some cases, undesired consequences may result from reductions of ammonia, such as increased acidity levels for particles and deposition. For these reasons, EPA proposes that ammonia would only be identified as a precursor to PM<sub>2.5</sub> NAAQS in a nonattainment area for purposes of NSR on a case-by-case basis. If the State demonstrates to the Administrator's satisfaction that ammonia emissions from stationary sources in a specific nonattainment area are a significant contributor to that area's ambient PM<sub>2.5</sub> concentrations, then the State would regulate ammonia as a PM<sub>2.5</sub> precursor under the NSR program in that nonattainment area. Therefore the State would need to regulate construction and modification of stationary sources that increase emissions of ammonia in that area to assure that these emissions do not interfere with reasonable further progress or the ability of that area to attain or maintain the PM<sub>2.5</sub> NAAQS. However, in other nonattainment areas, we would not require States to include ammonia in their NSR programs. We are not proposing to identify ammonia as a regulated NSR pollutant for purposes of PSD in any attainment or unclassifiable areas.

The EPA requests comments on this approach for addressing ammonia emissions under the NSR programs.

4. What is a major stationary source (major source) under the major NSR program for PM<sub>2.5</sub>?

a. Background

The major NSR program applies to construction of major stationary sources and major modifications at major stationary sources. A stationary source is a "major source" if its actual emissions or its potential to emit for a specific pollutant equals or exceeds the major source threshold for that pollutant established in the CAA. Different pollutants are not summed to determine applicability.

b. Proposed Option

Sections 169 and 302(j) of the Act contain definitions of "major emitting facility" and "major stationary source" that apply to programs implemented under part C and subpart 1 of part D of the Act. Accordingly, we are proposing to follow these definitions for purposes of defining a major emitting facility or

major stationary source that would be subject to major NSR based on direct PM<sub>2.5</sub> emissions or emissions of pollutants identified as PM<sub>2.5</sub> precursors for the NSR program. This approach is also consistent with how we treat other criteria pollutants that are covered by subpart 1 of part D of the Clean Air Act and thus are not subject to a tiered classification system such as the one required for ozone nonattainment areas under subpart 2 of the Clean Air Act. EPA does not interpret subpart 4 of part D of the Act (creating "serious" and "moderate" classifications for PM<sub>10</sub> nonattainment areas) to apply to PM<sub>2.5</sub>.

This means the major source thresholds would be:

PSD .....	100 tpy for source categories listed in 40 CFR 51.166(b)(1)(i)(a) and 52.21(b)(1)(i)(a).
	250 tpy for all other source categories.
NA NSR ..	100 tpy for all source categories.

Thus, no regulatory change would be required. See §§ 51.165(a)(1)(iv)(a); 51.166(b)(1)(i); 52.21(b)(1)(i); Appendix S, Section II.A.4.

We request comment on this approach for establishing the major source threshold for purposes of the major NSR program for the PM<sub>2.5</sub> NAAQS. We also request comment on whether the definitions in Section 169 and 302(j) are controlling for purposes of establishing the definition of major stationary source for the PM<sub>2.5</sub> NAAQS, which is being implemented under part C and subpart 1 of part D of the Act.

c. What is the effect of this proposed option?

Although our proposed approach is consistent with Sections 169 and 302(j) and Subpart 1 of part D of the Act, this approach results in a higher major source threshold in PM<sub>2.5</sub> nonattainment areas than the major source threshold that applies in some PM<sub>10</sub> nonattainment areas under Subpart 4 of part D of the Act. This is because Section 189(b) of the Act establishes a 70 tpy major source threshold for "serious" PM<sub>10</sub> nonattainment areas while "moderate" PM<sub>10</sub> nonattainment areas apply a 100 tpy major source threshold based on the definition in section 302(j). We do not believe the Act gives us the discretion to promulgate a lower major source threshold for pollutants such as PM<sub>2.5</sub> that are only subject to Subpart 1 of part D of the Act.

Nevertheless, we do not believe this situation will adversely impact attainment of the PM<sub>2.5</sub> NAAQS. Data

from EPA's emissions inventory indicate that a significant number of sources have actual PM<sub>2.5</sub> emissions in the 100 to 250 tpy range. Additionally, the more current inventory data shows that the number of sources that would be covered as major sources by a lower major source threshold would not increase substantially unless the threshold were lowered to 20 tpy or below. Thus, even if EPA had the discretion to adopt a 70 tpy major source threshold for PM<sub>2.5</sub> nonattainment areas, we do not believe that many additional sources would be subject to the major NSR program in PM<sub>2.5</sub> nonattainment areas.

States should consider this information in developing their own SIP-approved NSR programs. For example, if construction of PM<sub>2.5</sub> sources emitting 99 tpy with no major NSR controls and without mitigation would undermine a State's ability to achieve reasonable further progress or attain the PM<sub>2.5</sub> NAAQS, then the State should consider imposing emissions controls or other requirements on these sources through the State's minor NSR program.

5. What should the significant emissions rate be for direct emissions of PM<sub>2.5</sub>?

a. Background

The determination of what should be classified as a modification subject to major NSR is based, in part, on a significant emissions rate.<sup>100</sup> The NSR regulations define this term as a rate above which a net emissions increase will trigger major NSR permitting requirements if such increase results from a major modification. Sources are exempt from major NSR requirements if an emissions increase resulting from a modification is below this rate because EPA considers such lower emissions increase to be de minimis for purposes of the NSR program. The significant emissions rates for criteria pollutants are given below:

Criteria pollutant	Significant emissions rate (tpy)
Ozone .....	VOC: Any increase—40 tpy (dependent on NA classification). NO <sub>x</sub> : Any increase—40 tpy (dependent on NA classification).
NO <sub>2</sub> .....	NO <sub>x</sub> : 40 tpy.
PM <sub>10</sub> .....	15 tpy.
CO .....	100 tpy.
SO <sub>2</sub> .....	40 tpy.
Lead .....	.6 tpy.

<sup>100</sup> For additional background on EPA's interpretation of modification and rationale for including significant emissions rates in defining major modifications, see 61 FR 38253-54 (Dec. 31, 2002).

The significant emissions rates listed in the above table apply to the direct and precursor pollutants listed in the table in section III.M.3.a. Significant emissions rates for additional pollutants that are subject to the PSD program are contained in the following provisions of our regulations:

- 40 CFR 51.166(b)(23) and
- 40 CFR 52.21(b)(23)

The EPA performed some preliminary modeling analyses to determine an appropriate significant emissions rate for direct emissions of PM<sub>2.5</sub>. Several typical stack heights (ranging from 5 to 200 meters in height) were modeled using meteorological data from Pittsburgh and Oklahoma City. Modelers ran ISCST (Industrial Source Complex Short Term model) to assess the impact of emissions increases on ambient PM<sub>2.5</sub> concentrations. EPA ran models for a variety of source types with varying meteorology, release heights, building shapes, and receptor locations.

The modeling produced the following results that we considered further in developing the options below:

- Shorter stacks had much more impact in the local area than taller stacks.
- Increases of about 5 tons per year from facilities with short stacks were shown to cause a measurable increase in ambient PM<sub>2.5</sub> concentrations.
- Emissions increases from tall stacks, 100 meters or greater, were associated with a small increase in ambient PM<sub>2.5</sub> concentrations in the immediate area.

b. Proposed Options

Preferred option 1: For direct emissions of PM<sub>2.5</sub>, EPA is proposing to define the significant emissions rate as 10 tons per year. This proposal is based fundamentally on the same approach as we used in setting the significant emissions rate for total suspended particulate matter (TSP) and PM<sub>10</sub>.

Historically, the significant emissions rate for TSP (equal or exceeding 25 tons per year) was set by analyzing the source size that would be unlikely to cause impacts above 4 percent of the standard (4 percent of 260 µg/m<sup>3</sup> or 10.4 µg/m<sup>3</sup> as a 24-hour average). Although a range of source configurations can yield a wide range of impacts per ton per year of emissions, EPA reviewed typical configurations of major TSP sources and concluded that a major modification that increased emissions by 25 tons per year or more would be unlikely to increase 24-hour average TSP concentrations by more than 10.4 µg/m<sup>3</sup>.

When EPA set the significant emissions rate for PM<sub>10</sub>, we first determined the ratio between the

controlling standards for PM<sub>10</sub> and TSP, *i.e.* (150 µg/m<sup>3</sup>)/(260 µg/m<sup>3</sup>) or about 3/5. Both of these standards are based on a year's second highest 24-hour average concentration. The EPA then set the PM<sub>10</sub> significant emissions rate at about 3/5 of 25 tons per year, which (with rounding) is 15 tons per year. This reflects the fact that a source emitting 25 tons of TSP per year that has an impact of 4 percent of the TSP standard would show an impact from 15 tons PM<sub>10</sub> per year of approximately 4 percent of the PM<sub>10</sub> standard (*i.e.*, 6 µg/m<sup>3</sup>).

Conceptually, EPA is proposing a significant emissions rate for PM<sub>2.5</sub> based on the same approach. However, the comparison of the PM<sub>2.5</sub> standard with earlier particulate matter standards is complicated by the difference in the averaging times of the controlling standards, which are 24-hour average values for TSP and PM<sub>10</sub> but an annual average value for PM<sub>2.5</sub>. Because the annual standard is the generally controlling standard for lowering both short-term and long-term ambient PM<sub>2.5</sub> concentrations (62 FR at 38669), EPA proposes using the annual standard to determine the significant emissions rate.

We conducted additional modeling using the ISC3 model to compare annual average and 24-hour average impacts of a fixed emissions rate for a variety of source configurations. Several typical stack heights (ranging from 5 to 200 meters in height) were modeled using meteorological data from Pittsburgh and Oklahoma City and both with and without downwash from different building types.

Our analysis of these modeling results shows that a major modification that increases direct PM<sub>2.5</sub> emissions by less than 10 tons per year would be unlikely to increase annual average ambient PM<sub>2.5</sub> concentrations by more than 4 percent of the annual PM<sub>2.5</sub> standard. This finding relies on EPA's comparison of annual average versus 24-hour average concentrations. As noted above, EPA previously concluded that a source that increases PM<sub>10</sub> emissions by 15 tons per year would likely cause an increase in the 24-hour average PM<sub>10</sub> concentration by 6 µg/m<sup>3</sup> or less. Based on the ratios between annual and 24-hour average concentrations found in EPA's recent modeling, a source having that impact would typically increase annual average PM<sub>10</sub> concentrations by about 0.8 µg/m<sup>3</sup> or less. The EPA is using a target PM<sub>2.5</sub> impact of 4 percent of the annual PM<sub>2.5</sub> standard or 0.6 µg/m<sup>3</sup>. This target impact is (0.6 µg/m<sup>3</sup>)/(0.8 µg/m<sup>3</sup>) or 3/4 of the potential impact of a 15 ton per year emissions increase. This suggests a significant emissions rate of 3/4 of 15 tons per year. By

rounding the result, we determined that an emissions increase below 10 tons per year increase in direct PM<sub>2.5</sub> emissions would be unlikely to increase ambient PM<sub>2.5</sub> concentrations by more than 4 percent of the annual PM<sub>2.5</sub> standard.

Option 2: The EPA recognizes that a range of source configurations can have a range of impacts, that the PM<sub>2.5</sub> source population differs in some respects from the TSP and PM<sub>10</sub> source population and that the acceptable stationary source impact on ambient PM<sub>2.5</sub> concentrations may warrant being defined differently from the acceptable impact for TSP or PM<sub>10</sub>. The EPA specifically solicits comments on a range of potential thresholds ranging from 5 to 15 tons per year for the significant emissions rate for PM<sub>2.5</sub> direct emissions. The upper bound is a set rate of 15 tons per year because that is the significant emissions rate for PM<sub>10</sub>. The lower bound is a set rate of 5 tons per year because our modeling indicates that an increase in ambient PM<sub>2.5</sub> concentrations above the target de minimis impact level can occur where facilities with short stacks have PM<sub>2.5</sub> emissions increases of about 5 tons per year.

We solicit comments on the proposed significant emissions rate level and on any other approaches for determining this value.

#### 6. What should be the significant emissions rates for PM<sub>2.5</sub> precursors?

##### a. Background

It is difficult to determine the ambient air quality effects that result from a single source of emissions of PM<sub>2.5</sub> precursors. There are conservative screening models for predicting impacts of large NO<sub>x</sub> and SO<sub>2</sub> sources on ambient PM<sub>2.5</sub> concentrations. We conducted a range of modeling analyses to determine the amount of PM<sub>2.5</sub> precursor emissions needed to show an increase in ambient PM<sub>2.5</sub> concentrations. These analyses showed that precursor emissions probably have some localized impacts, but that most impact is farther downwind as precursors have the time to convert to PM<sub>2.5</sub>. In addition, the modeling available at this time does not provide sufficient information to estimate impacts of single source emissions of ammonia and VOC on ambient PM<sub>2.5</sub> concentrations.

Although we have not finally determined which pollutants (if any) will be regulated as PM<sub>2.5</sub> precursors under the NSR program, we are proposing significant emissions rates in the event that the precursors under consideration are identified as such for

the major NSR program. In the event that EPA adopts an "opt-in" approach—that is, the presumption that a precursor is not subject to NSR unless a State demonstrates to the Administrator's satisfaction that it should be included—the State opting in would be required to adopt the significant emissions rate for the precursor as set forth below, in the absence of demonstrating that another significant emissions rate is more appropriate.

##### b. Proposed Options

Preferred Option 1: The EPA proposes the use of existing significant emissions rates for those pollutants already included in major NSR programs as shown below:

Pollutant	Significant emissions rate (equal or exceeding)
NO <sub>x</sub> .....	40 tpy.
SO <sub>2</sub> .....	40 tpy.
VOC .....	40 tpy.

The use of existing significant emission rates where the PM<sub>2.5</sub> precursor is also regulated under NSR for a separate criteria pollutant harmonizes the NSR program for PM<sub>2.5</sub> with the NSR programs for those other criteria pollutants. This enables a source to determine the NSR impacts of proposed modifications by reference to a single significant emissions rate for each pollutant, and enables streamlining of determinations regarding the applicable control technology and analysis of air quality impacts into a single and comprehensive decision making process for both PM<sub>2.5</sub> and other criteria pollutants that also cover PM<sub>2.5</sub> precursors. This also follows precedent. When ozone became a criteria pollutant EPA used the NO<sub>x</sub> significant emissions rate from the NO<sub>2</sub> program.

EPA has never set a significant emissions rate for ammonia to determine major NSR applicability. A necessary component of our approach to NSR applicability for ammonia is that those States who determine in their SIPs that control of ammonia is necessary will set the significant emissions rate for ammonia based on the information presented in each attainment demonstration.

Option 2: Set the precursor levels at the same level as the significant emission rate for PM<sub>2.5</sub> direct emissions, that is, 10 TPY. This would make more modifications subject to PM<sub>2.5</sub> permitting requirements and therefore could provide more protection to the environment. This does not, however, follow the precedent in the ozone NSR program. Having several different significant emissions rates for the same



pollutant would add additional complexity to an already complex program without necessarily providing additional environmental benefits.

We request comment on the options listed above and on any other approaches for establishing precursor significant emissions rates.

7. What is the role of condensible emissions in determining major NSR applicability?

Condensible emissions commonly make up a significant component of PM<sub>2.5</sub> emissions. As discussed in Sections IV.I. and IV.P, certain sources utilizing high temperature processes emit gaseous pollutants into the ambient air which rapidly condense into particle form. The constituents of these condensed particles include, but are not limited to, organic material, sulfuric acid, nitrates, and metals.

The EPA has issued guidance clarifying that PM<sub>10</sub> includes condensible particles and that, where condensible particles are expected to be significant, States should use methods that measure condensible emissions.<sup>101</sup> States are already required under the consolidated emissions reporting rule to report condensible emissions in each inventory revision (see 67 FR 39602, June 10, 2001), and Method 202 in Appendix M of 40 CFR part 51 quantifies condensible particulate matter.

However, because of the flexibility incorporated into EPA's approach to the issue and the inconsistent implementation of the existing guidance, there have been some misconceptions as to whether condensible emissions must be included in a source's PM<sub>10</sub> emissions under the PM<sub>10</sub> standard in determining NSR applicability. The rules at 40 CFR 51.100 define "PM emissions" and "PM<sub>10</sub> emissions" by reference to the PM measured by applicable reference methods, an equivalent or alternative method specified in part 51, or by a test method specified in an approved SIP. See 40 CFR 51.100(pp), (rr), and § 52.01 (incorporating § 51.100 definitions by default). As discussed in Section III.P., different test methods measure

condensible emissions with varying levels of accuracy. In addition, sources often project their emissions increases from new construction and modifications based on emissions factors, such as AP-42 factors, that in some cases have not accounted for condensible emissions. Sources have used other methods to project their PM emissions that do not account for condensible emissions (e.g., projecting PM<sub>10</sub> impacts based on an analysis of existing TSP limits without adding condensible emissions).

We are proposing to clarify in this rule that condensible emissions must be included when determining whether a source is subject to the major NSR program. The inclusion of condensible emissions in a source's PM<sub>2.5</sub> emissions is of increasing importance with the change in the indicator for particulate matter to PM<sub>2.5</sub>. Condensible emissions are essentially fine particles, and thus are a larger fraction of PM<sub>2.5</sub> emissions than of TSP or PM<sub>10</sub> emissions. Condensible emissions commonly make up a significant component of PM<sub>2.5</sub> emissions, and the failure to include them may result in adverse consequences to the environment.

While EPA has always included condensible emissions in its definition of particulate matter emissions, insofar as these emissions are measured by applicable test methods or included in emissions factors, we believe that the greater significance of condensible emissions in addressing PM<sub>2.5</sub> warrants greater emphasis on including these emissions in implementing the major NSR program. A key aspect of this issue is the development of the new test method discussed in Section III.P., which quantifies and can be used to characterize the constituents of PM<sub>2.5</sub> emissions, including both the filterable and condensible portion of the emissions stream.

8. What are the requirements of the Prevention of Significant Deterioration (PSD) program for attainment areas?

*Background.* Sources subject to PSD must:

- Install Best Available Control Technology (BACT),

- Conduct air quality modeling analyses to ensure that the project's emissions will not cause or contribute to:

- A violation of any NAAQS or maximum allowable pollutant increase (PSD increment),
- Any impact on any Class I area air quality related value, and
- As required, perform preconstruction monitoring.

Each of these elements is discussed below.

9. How should BACT be implemented?

We are not proposing any change to our current policy for implementing BACT requirements at a major source that is subject to the requirements of the PSD program. Accordingly, if a physical or operational change at the source will result in a significant emissions increase and a significant net emissions increase of a regulated NSR pollutant, then the major source must apply BACT (for that pollutant) to the emissions unit(s) that will be physically or operationally changed as a part of that project. Under the PM<sub>2.5</sub> major NSR program, BACT will be required at an emissions unit if a physical or operational change at the unit causes a significant emissions increase and significant net emissions increase of PM<sub>2.5</sub> direct emissions, or a PM<sub>2.5</sub> precursor, if applicable at the major stationary source.

10. What is EPA's plan for preventing significant deterioration of air quality for PM<sub>2.5</sub>?

*Background.* The PSD provisions of the CAA limit the degradation of ambient air concentrations of certain pollutants. The CAA does not dictate the mechanism to achieve this result for pollutants other than PM<sub>10</sub> and SO<sub>2</sub>. One mechanism involves a system of "increments" and area classifications that define significant deterioration for individual pollutants. The PSD increments are the maximum allowable increase in ambient air concentrations above a baseline concentration for a criteria pollutant. The current increments are:

Pollutant/averaging time	Class I	Class II	Class III
PM <sub>10</sub>			
Annual average .....	4 µg/m <sup>3</sup>	17 µg/m <sup>3</sup>	34 µg/m <sup>3</sup>
8-Hour average .....	8 µg/m <sup>3</sup>	30 µg/m <sup>3</sup>	60 µg/m <sup>3</sup>
SO <sub>2</sub>			
Annual average .....	2 µg/m <sup>3</sup>	20 µg/m <sup>3</sup>	40 µg/m <sup>3</sup>
24-hour average .....	5 µg/m <sup>3</sup>	91 µg/m <sup>3</sup>	182 µg/m <sup>3</sup>
3 Hour Average .....	25 µg/m <sup>3</sup>	512 µg/m <sup>3</sup>	700 µg/m <sup>3</sup>

<sup>101</sup> Memo. from Thompson G. Pace, Acting Chief, Particulate Matter Programs Branch, to Sean

Fitzsimmons, Iowa Department of Natural Resources, (Mar. 31, 1994) (copy available at

<http://www.epa.gov/Region7/programs/artd/air/nsr.nsrmemos/cpm.pdf>).

Pollutant/averaging time	Class I	Class II	Class III
NO <sub>2</sub> —Annual Average .....	2.5 µg/m <sup>3</sup>	25 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>

We are in the process of developing an approach for preventing significant deterioration of air quality which may include PM<sub>2.5</sub> increments. The EPA has placed this action on a separate administrative track due to the additional time necessary to fully develop any potential proposal. In the interim period, States must continue to implement the PM<sub>10</sub> increments in 40 CFR 51.166, 52.21 and/or their SIPs, as applicable.

11. How will the air quality analysis required under section 165(a)(3) be implemented?

Scope of the Requirement. All sources subject to PSD review must perform an ambient air quality impact analysis to show that the emissions from the source do not cause or contribute to a PSD increment or NAAQS violation. See CAA Section 165(a)(3); 40 CFR 51.166(k), 52.21(k). Accordingly,

sources will be required to perform this analysis for the PM<sub>2.5</sub> NAAQS. Such analyses would consider how a source impacts air quality at existing PM<sub>2.5</sub> monitor locations as well as at other locations which are appropriate to allow the comparison of predicted PM<sub>2.5</sub> concentrations to the NAAQS, based on PM<sub>2.5</sub> monitor siting requirements and recommendations.

Sources also will remain under an obligation to perform the air quality impact analysis for the PM<sub>10</sub> increments and the PM<sub>10</sub> NAAQS.

*Plan for Development of Significant Impact Levels for PM<sub>2.5</sub>.* The Agency has had a practice of exempting sources from the cumulative air quality impact analyses where their level of contribution is below a significant impact level (SIL). If the maximum ambient impacts from the proposed project are less than a SIL, the source

- Is presumed to not cause or significantly contribute to a PSD increment or NAAQS violation, and
- Is not required to perform multiple source cumulative impact assessments.

The EPA has long interpreted the “significant contribution” test set forth in § 51.165(b)(2) to apply to the PSD program since the provision applies to major new sources and major modifications located in attainment and unclassifiable areas. We have proposed codifying this exemption in the PSD regulations in a separate **Federal Register** notice. See 61 FR 38249, 38293 (July 23, 1996). This exemption is based on the de minimis nature of the source’s contribution.

The SIL (in µg/m<sup>3</sup>) have been established for other criteria pollutants with PSD increments and are given below:

Criteria pollutant	Averaging time	Class I SIL µg/m <sup>3</sup> (proposed 7/23/96, not promulgated)	Class II and III SIL µg/m <sup>3</sup>
SO <sub>2</sub> .....	3 hour .....	1.0	25.0
	24-hour .....	.2	5.0
	Annual .....	.1	1.0
CO .....	1 hour .....	N/A	2000
	8 hours .....	N/A	500
NO <sub>2</sub> .....	Annual .....	.1	1.0
PM <sub>10</sub> .....	24-hour .....	.3	5.0
	Annual .....	.2	1.0

Because the SIL benefits the NSR permitting program by exempting sources with *de minimis* impacts from the cumulative air quality analysis, EPA is considering establishing PM<sub>2.5</sub> SIL for emissions of PM<sub>2.5</sub> direct. This would enable sources with impacts below the SIL to avoid the cumulative air quality impact analysis with respect to their potential contribution to a PM<sub>2.5</sub> NAAQS violation, and create a *de minimis* “cause or contribute” definition for violations. Direct PM<sub>2.5</sub> emissions can be evaluated with current models. Therefore, the development of SIL for impact evaluations of direct PM<sub>2.5</sub> emissions is technically achievable. The EPA is soliciting comments on this question and on methods for the development of PM<sub>2.5</sub> SIL.

The limited capabilities of existing models make it difficult to establish and implement SIL for PM<sub>2.5</sub> precursors.

Current models are only able to accurately address individual source impacts associated with direct PM<sub>2.5</sub> emissions and, to a lesser degree, SO<sub>2</sub> and NO<sub>x</sub>. They can not accurately predict single source impacts on ambient PM<sub>2.5</sub> concentrations from other precursors. Without including formation of PM<sub>2.5</sub> from precursor emissions, the complete impact cannot be assessed.

EPA solicits comments and ideas on the direction to take and possible approaches to setting PM<sub>2.5</sub> SIL for direct and precursor emissions. The EPA intends to use these comments in developing SIL on a separate administrative track.

12. How should the PSD pre-construction monitoring requirement be implemented for PM<sub>2.5</sub>?

EPA solicits comment on what preconstruction monitoring

requirements should be required by the PM<sub>2.5</sub> PSD program.

a. Background

Sources subject to PSD are subject to pre-construction ambient air quality monitoring requirements. See Sections 165(a)(7) and 165(e) of the CAA and 40 CFR 51.166(m), § 52.21(m). The PSD permitting requirements currently provide that continuous pre-construction ambient air quality monitoring must be conducted for any criteria pollutant emitted in significant amounts. Under 40 CFR 51.166(i)(5), and 40 CFR 52.21(i)(5) the reviewing authority has the discretion to exempt an applicant from this monitoring requirement if:

- The maximum modeled concentration for the applicable averaging period caused by the proposed significant emissions increase (or net emissions increase) is less than

the prescribed significant monitoring concentration (SMC); or

- The existing monitored ambient concentrations are less than the prescribed SMC. The following are the SMC for criteria pollutants:

Pollutants	Ambient concentration ( $\mu\text{g}/\text{m}^3$ )	Averaging period
CO .....	575	8 hours.
NO <sub>2</sub> .....	14	Annual.
SO <sub>2</sub> .....	13	24 hours.
PM <sub>10</sub> .....	10	24 hours.

A source may also use existing data as a surrogate for pre-construction monitoring if the existing monitored data record is determined to be representative of the project's location. For information on representative monitoring see "Ambient Monitoring Guideline for Prevention of Significant Deterioration (PSD)," EPA-450/4-87-007. Under the current regulatory approach, the need for pre-construction monitoring by an applicant depends on the spatial and temporal coverage of the current monitoring program. The expected gradients of concentration between existing monitors also need to be considered in deciding whether there is a need for pre-construction ambient monitoring.

The PM<sub>2.5</sub> ambient monitoring data are used in the PSD program to:

- Establish current PM<sub>2.5</sub> NAAQS compliance status in the project's impact area;
- Determine a representative background ambient PM<sub>2.5</sub> concentration which will be included with modeled estimates to assess NAAQS compliance.

The PM<sub>2.5</sub> ambient monitoring measurements include particulate matter from PM<sub>2.5</sub> direct emissions and those formed by PM<sub>2.5</sub> precursors. If required of a particular source, pre-construction monitoring could add one year to the permitting process and increase the cost of the permit. Such a requirement could have the effect of delaying or preventing sources from undertaking environmentally beneficial projects. Accordingly, today, we are reconsidering our current approach for satisfying the pre-construction monitoring requirements for the purposes of the PM<sub>2.5</sub> standard. While we are proposing to retain the current approach, we are also soliciting comments on innovative options that could provide better solutions for satisfying the preconstruction monitoring requirements.

b. Options for PSD Preconstruction Monitoring

Preferred Option 1: Require preconstruction monitoring for all major sources of PM<sub>2.5</sub> direct and the precursors identified as regulated NSR pollutants for PM<sub>2.5</sub>, but on a case-by-case basis allow sources to satisfy this requirement by demonstrating the existing PM<sub>2.5</sub> network is sufficient. This option will provide information on effects of new construction on the PM<sub>2.5</sub> NAAQS and increments. This option would not require a change to the preconstruction monitoring regulations. Concerns about this option include:

- It is challenging to find an appropriate location for any monitor because PM<sub>2.5</sub> direct emissions typically affect nearby locations while precursor emissions affect areas farther away.
- The existing monitors can either measure total PM<sub>2.5</sub> mass or can provide data on the mass of different PM<sub>2.5</sub> components. The latter type, a speciation monitor, is more expensive to operate but provides useful information on the contribution of sources of precursor and PM<sub>2.5</sub> direct emissions.

In cases where ambient PM<sub>2.5</sub> concentration gradients between existing monitors are small with little likelihood of local site-specific "hot spots," interpolation between existing monitored values may be appropriate for determining that the existing PM<sub>2.5</sub> monitoring network is sufficient. We request comment on this approach.

Option 2: Exempt all PM<sub>2.5</sub> sources from doing monitoring by determining the existing PM<sub>2.5</sub> network is sufficient.

The use of the acquired PM<sub>2.5</sub> monitored data record in place of applicant performed pre-construction monitoring would follow the current trend in PSD permitting activities. This procedure would have the advantage of reducing the time required for permit preparation and reduce the costs of the permit application. If ambient PM<sub>2.5</sub> concentration gradients between monitoring stations are small there may be little need for additional monitoring data. The need to make discretionary decisions on whether to perform pre-construction monitoring would be eliminated.

However, EPA favors the continued use of the case-by-case determination as to the need to perform ambient PM<sub>2.5</sub> pre-construction monitoring because of the following limitations to using the existing PM<sub>2.5</sub> monitoring data record:

- The PM<sub>2.5</sub> monitoring data record would require spatial interpolation between monitors for the determination of appropriate concentrations at the project's location.

- Use of existing monitored data will not increase the PM<sub>2.5</sub> monitoring data record to confirm or contradict conventional perceptions.

- The PM<sub>2.5</sub> monitoring data record assumes that local hot spots of high PM<sub>2.5</sub> concentrations do not exist or are already being monitored, which may not be true in all cases.

- Automatic acceptance of existing measurements does not follow EPA's current policy that a case-by-case determination needs to be made to determine whether pre-construction ambient monitoring is necessary.
- When used with the impact modeling, separate concentrations of direct and precursor formed particulate matter is needed.

Because of these limitations, existing PM<sub>2.5</sub> monitoring data must be reviewed for applicability and representativeness before being judged appropriate for use in lieu of project acquired ambient data. The current PM<sub>2.5</sub> network may not be sufficient for all applicants. The EPA is soliciting comments and suggestions on this issue.

Option 3: Use Significant Monitoring Concentrations (SMC) to exempt sources from pre-construction monitoring requirements. The reviewing authority has the discretion to exempt an applicant from the pre-construction monitoring requirement if the modeled impacts from the proposed source are less than the prescribed SMC.

Similar to the significant impact levels used in modeled impact analysis, the PSD process will become simpler through the use of SMC. It provides a definitive means for applicants with little impact to opt out of the resource intensive, costly, and time consuming pre-construction ambient air quality monitoring requirement. Therefore, it is an important component of the PSD program.

The form of the SMC will be defined by the form of the impact modeling. SMC must be developed for direct PM<sub>2.5</sub> emissions if the impact modeling only addresses direct emissions of PM<sub>2.5</sub>. This may require different direct and precursor SMC.

Because of the advantages SMC provide to the NSR permitting program, EPA is considering the development of PM<sub>2.5</sub> SMC. The EPA is soliciting comments on the development and use of PM<sub>2.5</sub> SMC in the PSD program. This option could be used in combination with the other options described.

Option 4: Use of the available large PM<sub>10</sub> data record, combined with the recent PM<sub>2.5</sub> acquired ambient measurements, may provide a monitoring data base that is sufficiently distributed to provide representative

ambient measurements for most applicants. This would alleviate the need for pre-construction monitoring and make the PSD program less burdensome. This would also provide an interim means to estimate ambient PM<sub>2.5</sub> concentrations until more extensive monitoring data record can be developed.

However, the differences in characteristics between PM<sub>2.5</sub> and PM<sub>10</sub>, and our limited understanding of their relationships, presents a problem.

- PM<sub>10</sub> conversion factors may not sufficiently reflect important industry specific and spatially related characteristics of PM<sub>2.5</sub>.
- Removing the obligation to provide pre-construction ambient monitoring data would eliminate industry's contribution to the ambient PM<sub>2.5</sub> data record.

This may not be a viable substitute to satisfy the need to provide representative PM<sub>2.5</sub> ambient measurements. The EPA requests comments on these options on pre-construction monitoring.

Option 5: Existing § 52.21(i)(5)(ii) and § 51.166(i)(5)(iii) could be interpreted to allow a reviewing authority to exempt an applicant from pre-construction monitoring for any pollutant for which we have not established a SMC. These provisions state that a source may be exempted from preconstruction monitoring "if \* \* \* the pollutant is not listed in" the list of pollutants for which SMC have been set.<sup>102</sup> The original rationale for this exemption is based on the lack of adequate methods for measuring ambient concentrations of pollutants not on the list. 45 FR at 52709, 52723–52724. We request comment on this interpretation and any other legal or policy rationale that could support applying the text of these provisions to exempt sources from preconstruction monitoring if we do not define a SMC for PM<sub>2.5</sub>.

13. Nonattainment New Source Review (NA NSR) Requirements

*Background.* Sources subject to NA NSR must:

- Install Lowest Achievable Emissions Rate (LAER) control technology;

<sup>102</sup> These sections actually cross-reference the list at § 51.166(i)(8)(i) and 52.21(i)(8)(i), however we renumbered those sections to subsection (i)(5)(i) of those provisions in December 2002 and inadvertently overlooked correcting the cross-references in subsections (i)(5)(ii) and (i)(5)(iii). See 67 FR 80186. It is apparent from the rule as originally promulgated in 1980 that subsection (i)(5)(i) is now the correct cross-reference. See 45 FR 52676, 52739 (Aug. 7, 1980). We propose to correct this misnumbering and others in this section when we finalize today's proposal.

- Offset new emissions with creditable emissions reductions.
- Certify that all sources owned and operated by the same owner within the State are in compliance; and,
- Conduct an alternative siting analysis demonstrating that the benefits of the proposed source significantly outweigh the environmental and social costs.

14. What are the offset requirements for NA NSR?

*Background.* Under Section 173 of the Act, all major sources and major modifications at existing sources within a nonattainment area must obtain emissions reductions to offset any emissions increases resulting from the project in an amount that is at least equal to the emissions increase, and that is consistent with reasonable further progress towards attainment. In addition, these offsets must be:

- From the same nonattainment area or a different nonattainment area that impacts the area where the source is located (as long as the other area has the same or higher classification);
- Federally enforceable; and
- Affect air quality in the area where the emissions increase from the new major source or modification are occurring.

We refer to the proportional difference between the amount of the required offsets to the amount of emissions increase as the "offset ratio." The offset ratios for the other criteria pollutants are:

Pollutant	Offset ratio
Ozone .....	At least 1:1 to 1.5:1 depending on ozone nonattainment classification.
PM <sub>10</sub> .....	At least 1:1.
NO <sub>x</sub> .....	At least 1:1.
SO <sub>2</sub> .....	At least 1:1.
Lead .....	At least 1:1.
CO .....	At least 1:1.

a. What is the required offset ratio for PM<sub>2.5</sub> direct emissions?

The Act specifies an offset ratio for several situations. In ozone nonattainment areas subject to subpart 2, the ratio is set between 1.1:1 and 1.5:1 depending on the area's level of classification pursuant to subpart 2 of the Act. For other nonattainment areas, the Act establishes a minimum offset ratio of 1:1 pursuant to Subpart 1 of the Act. Since the PM<sub>2.5</sub> program is being implemented under subpart 1, the applicable ratio is at least 1:1 on a mass basis. We request comment on establishing a required offset ratio of at least 1:1, and on any other option for

establishing the required offset ratio for PM<sub>2.5</sub> direct emissions.

b. Which precursors shall be subject to the offset requirement?

If we identify a precursor as a regulated NSR pollutant in our final action, then that pollutant will be subject to the offset requirement. Accordingly, consistent with our preferred approach for identifying SO<sub>2</sub> as a national precursor and NO<sub>x</sub> as a presumptive national precursor, we propose that SO<sub>2</sub> and NO<sub>x</sub> would be subject to the offset requirement. VOCs and ammonia would be subject to the offset requirement if we designated these pollutants as PM<sub>2.5</sub> precursors for the purposes of major NSR. If we adopt an approach under which the precursors are presumptively excluded from major NSR unless and until a State NA NSR program specifically includes such a pollutant, then the precursor would not be subject to the offset requirement until such time.

c. What is the required offset ratio for PM<sub>2.5</sub> precursors?

The Act requires that a source obtain offsets for emissions increases that occur in a nonattainment area. As with PM<sub>2.5</sub> direct emissions, the minimum offset ratio permitted under the Act would be at least 1:1. We believe this ratio should apply where a source seeks to offset an increase in emissions of a PM<sub>2.5</sub> precursor with creditable reductions of the same precursor. We request comment on requiring an offset ratio of at least 1:1 for any precursor identified by the Administrator as a regulated NSR pollutant for PM<sub>2.5</sub> nonattainment areas. We also request comment on whether this mandatory offset ratio should apply to any other precursor identified by a State for regulation through its SIP-approved nonattainment major NSR program, or whether the State should have the option to establish a different offset ratio for such pollutant.

d. Should EPA allow interprecursor trading to comply with the offset requirement?

Because several different pollutants contribute to ambient PM<sub>2.5</sub> concentrations, we are proposing to allow flexibility in how major sources may satisfy the offset requirement. Specifically, we are proposing to allow increases in emissions of direct PM<sub>2.5</sub> precursor emissions; and we are proposing to allow an increase in a PM<sub>2.5</sub> precursor to be offset by a decrease in emissions of a different PM<sub>2.5</sub> precursor or with PM<sub>2.5</sub> direct

emissions. However, such trades would only be permissible if the State shows that the trade is beneficial in reducing overall ambient concentrations of PM<sub>2.5</sub>, and the Administrator approves of the trade.

This additional flexibility might make it difficult to ensure that the ambient air concentration of PM<sub>2.5</sub> continues to decrease. It may also be administratively difficult to manage. Nonetheless, we are proposing to allow interprecursor trading to generate creditable emissions reductions for use as offsets, because we believe that reductions of a different PM<sub>2.5</sub> precursor may have an equal or better impact in reducing ambient PM<sub>2.5</sub> concentrations if an appropriate offset ratio is determined. Additionally, interprecursor trading may provide a reliable source of offset emissions in areas where availability may otherwise be limited.

There are several ways in which interprecursor trading for offsets could be implemented. Under one approach, a State would develop its own interprecursor trading rule for inclusion in its SIP, based on a modeling demonstration for a specific nonattainment area. The EPA would review a State interprecursor trading rule during the SIP approval process. Once approved, the State could follow this approach on all future NSR permits issued. Another approach would be to review individual trades as part of the major NSR permitting process. The EPA and the public would have an opportunity to comment on whether the modeling or other technical evidence presented by a particular State is sufficient to support interprecursor offsets for that specific permit application. Under either approach, a State could not allow interprecursor trading without EPA approval. The EPA is requesting comment on whether, States should be required to demonstrate the adequacy of offset ratio(s) using modeling as part of a State rule, in demonstrations for specific nonattainment areas, and/or on a permit-by-permit basis, and/or on some other basis. While EPA believes that such interprecursor trading flexibility is more appropriate for offsets which are statutorily required, we are seeking comment on whether this flexibility should also apply to netting analysis for a source.

15. What are the implementation and transition issues associated with this rule?

*Implementation.* Implementation of NSR for PM<sub>2.5</sub> is dependent on:

- Who implements the program and

- What regulations are used to implement NSR.

The components of the NSR programs are implemented by the following:

- PSD: States or EPA
- Nonattainment NSR: State or EPA
- Minor NSR: States only
- NSR in Indian country: Tribes or EPA

*Transition.* The requirements applicable to NSR SIPs for and the obligation to subject sources to NSR permitting for PM<sub>2.5</sub> direct and precursor emissions are codified in the existing federal regulations, and can be implemented without specific regulatory changes. The existing regulations require NSR for any NAAQS pollutant for which an area is designated attainment or nonattainment. See 40 CFR 51.160(b); 51.165(a)(2)(i); 51.166(a)(7); 52.21(a)(2); 52.24(k); 40 CFR part 51, Appendix S, Section IV. A. Thus, the obligation to implement PSD for the NAAQS was triggered upon the effective date of the NAAQS, as explained in prior guidance.<sup>103</sup> (In that guidance, EPA also explained that PSD permitting for PM<sub>10</sub> would be accepted as a surrogate approach for this obligation, as discussed in more detail below.) For nonattainment areas, permits must comply with the nonattainment NSR requirements for PM<sub>2.5</sub>, either in a State's approved part D program or, where that is lacking, as set forth in 40 CFR part 51, Appendix S, pursuant to § 52.24(k). To clarify how these requirements are to be implemented for PM<sub>2.5</sub>, we are proposing to add provisions to:

- 40 CFR 51.166—implementation plan requirements for major new or modified sources in attainment or unclassifiable areas;
- 40 CFR 51.165—implementation plan requirements for addressing major new or modified sources in nonattainment areas and sources located in attainment or unclassifiable areas that would impact a nonattainment area;
- 40 CFR 52.21—the federal implementation plan for areas lacking an approved SIP or TIP program to regulate construction or modification of major stationary sources in an attainment or unclassifiable area.
- 40 CFR part 51, Appendix S—provisions for issuing permits before a State has an approved implementation plan regulating construction or modification of major stationary sources.

<sup>103</sup> See "Interim Implementation for New Source Review Requirements for PM<sub>2.5</sub>," J. Seitz, EPA (Oct. 23, 1997).

16. Implementation of PSD provisions during the SIP Development period

a. Background

On October 23, 1997, we issued a guidance document entitled "Interim Implementation for the New Source Review Requirements for PM<sub>2.5</sub>," John Seitz, EPA. As noted in that guidance, Section 165 of the Act suggests that PSD requirements become effective for a new NAAQS upon the effective date of the NAAQS. Section 165(a)(1) of the Act provides that no new or modified major source may be constructed without a PSD permit that meets all of the Section 165(a) requirements with respect to the regulated pollutant. Moreover, Section 165(a)(3) provides that the emissions from any such source may not cause or contribute to a violation of any NAAQS. Also, Section 165(a)(4) requires BACT for each pollutant subject to PSD regulation. The 1997 guidance stated that sources would be allowed to use implementation of a PM<sub>10</sub> program as a surrogate for meeting PM<sub>2.5</sub> NSR requirements until certain difficulties were resolved, primarily the lack of necessary tools to calculate the emissions of PM<sub>2.5</sub> and related precursors, the lack of adequate modeling techniques to project ambient impacts, and the lack of PM<sub>2.5</sub> monitoring sites. As discussed in this preamble, those difficulties have been resolved in most respects, and where they have not been, the proposal contains appropriate provisions to account for it. These issues will be finally resolved by the Agency upon promulgation of these proposed revisions. When final, these revisions will take effect immediately on the effective date in States that issue permits under a delegation from EPA. However, States with a SIP-approved PSD program requiring amendments to incorporate these rule changes will need additional time to incorporate the final NSR rule change for PM<sub>2.5</sub> into their SIPs. For example, a State may need to amend their existing regulations to add the specific significant emissions rate for PM<sub>2.5</sub> or a designated precursor. We propose to require that States with SIP-approved PSD programs submit revised PSD programs for PM<sub>2.5</sub> at the same time that they must submit nonattainment NSR programs for PM<sub>2.5</sub> (April 5, 2008).<sup>104</sup> However, during the SIP-

<sup>104</sup> We note that we requested that States submit certifications that their SIPs were adequate with respect to certain infrastructure elements, including PSD, for the PM<sub>2.5</sub> NAAQS, by July 2000, consistent with Section 110(a)(1) and (2). See Re-issue of the Early Planning Guidance for the Revised Ozone and Particulate Matter (PM) National Ambient Air

development period, the PM<sub>2.5</sub> NAAQS must still be protected under the PSD program in such States.

#### b. Proposed Options

Upon promulgation of this rule, States that accept delegation would implement the PM<sub>2.5</sub> program in 40 CFR 52.21 from the effective date of this rule. However, for SIP-approved States, we seek comment on the following options to address implementation of the PSD program from the time this rule is final until EPA approves a State's PSD program for PM<sub>2.5</sub>:

**Option 1—Continue Implementing the 1997 Guidance To use PM<sub>10</sub> Program as a Surrogate for PM<sub>2.5</sub>**

We are proposing that if a SIP-approved State is unable to implement a PSD program for the PM<sub>2.5</sub> NAAQS upon promulgation of these proposed revisions, then the State may continue to implement a PM<sub>10</sub> program as a surrogate to meet the PSD program requirements for PM<sub>2.5</sub> pursuant to the 1997 guidance mentioned above. However, to assure that use of PM<sub>10</sub> is protective of the PM<sub>2.5</sub> NAAQS, the State must assure that two requirements are met. First, States must require sources to demonstrate that emissions from construction or operation of the facility will not cause or contribute to a violation of the PM<sub>2.5</sub> NAAQS. We believe that States have the authority to implement this requirement through existing SIP-approved programs. Second, States will be required to include condensible particulate matter emissions in determining major NSR applicability and control requirements. As discussed elsewhere, PM<sub>10</sub> already includes condensible emissions, but many States have not regulated condensible emissions in implementing the PM<sub>10</sub> NAAQS because EPA has not consistently implemented its guidance on this issue. Because condensible emissions are essentially fine particles and a larger fraction of PM<sub>2.5</sub> emissions in comparison to PM<sub>10</sub>, EPA believes inclusion of condensible emissions during the SIP development period for PSD programs is necessary to ensure that the PM<sub>10</sub> indicator acts as an adequate surrogate for PM<sub>2.5</sub>.

Quality Standards (NAAQS) (June 16, 1998). In accordance with a Consent Decree in *Environmental Defense and American Lung Ass'n v. Johnson*, No. 1:05CV00493 (D.D.C. June 15, 2005), EPA must determine by October 4, 2008 whether each State has submitted SIP revisions for PM<sub>2.5</sub> required under section 110(a)(2) of the Clean Air Act.

**Option 2—Update the 1997 Guidance to Include Proposed Provisions of this Rule or Amend 40 CFR part 51, Appendix S to State That 40 CFR 52.21 Would Apply**

Another option would be to update the 1997 guidance to reflect the provisions in this proposed rule and allow States to run a PM<sub>2.5</sub> program pursuant to this updated guidance. Alternatively, we would amend Appendix S and 40 CFR 52.24 so that the PSD requirements of 40 CFR 52.21 would govern the issuance of major NSR permits during the period between the time we finalize this implementation rule and when we approve changes to the State's PSD program to include PM<sub>2.5</sub> as a regulated NSR pollutant. This provision would not apply to sources located in Indian Country because they are already directly subject to the requirements of 40 CFR 52.21.

If a State does not believe it has the authority to issue PSD permits consistent with Appendix S, then EPA would issue the permit. We specifically seek comment on whether we should update the 1997 guidance or amend Appendix S to allow States to run a PSD program for PM<sub>2.5</sub> in attainment areas during the SIP development period.

**Option 3—State Requests Delegation of 40 CFR 52.21**

A third option would be for EPA to allow a State to request delegation of just the federal PM<sub>2.5</sub> program (reflected in § 52.21 of our regulations) in that State. A State that otherwise has a SIP-approved PSD program could request delegation for PM<sub>2.5</sub> by informing EPA that it does not intend to submit a PSD SIP for PM<sub>2.5</sub> in the immediate future.

After promulgation of a new NAAQS, EPA may allow States up to three years to submit a State implementation plan containing a PSD program for that pollutant. 42 U.S.C. 7410(a). EPA's PSD regulation at § 51.166 gives SIP-approved States up to three years to submit a revision to their PSD program after EPA amends § 51.166. (§ 51.166(a)(6)). Under section 110(c) of the Act, EPA must promulgate a federal implementation plan (FIP) upon finding that a State has failed to make a required plan submission or that a required submission is inadequate.

If a State notifies EPA prior to the close of the customary three-year period that the State does not intend to submit a PSD SIP for PM<sub>2.5</sub> in the immediate future and requests delegation, we believe EPA could find that the State has failed to submit the requisite PSD SIP for PM<sub>2.5</sub>, promulgate a PSD FIP for PM<sub>2.5</sub> based on 40 CFR 52.21, and

delegate implementation of the federal PSD program to the State. The State would then be able to implement a PSD program for PM<sub>2.5</sub> in accordance with the terms of section 52.21, as amended in this rulemaking action. However, such a State would still have the option to obtain EPA approval of a PSD SIP for PM<sub>2.5</sub> if it submitted the SIP revision at a later date.

#### c. Rationale

We believe option 1 is reasonable for the following reasons. First, PM<sub>10</sub> will act as an adequate surrogate for PM<sub>2.5</sub> in most respects, because all new major sources and major modifications that would trigger PSD requirements for PM<sub>2.5</sub> would also trigger PM<sub>10</sub> requirements because PM<sub>2.5</sub> is a subset of PM<sub>10</sub>. The one situation where this would not be true is where a source emitted significant amounts of condensible emissions that would not otherwise be counted under a State's PM<sub>10</sub> PSD program. This is the reason EPA would ensure that States include condensible emissions in determining major NSR applicability as a condition of using PM<sub>10</sub> as a surrogate. Second, both of the precursors proposed for regulation in this preamble—SO<sub>2</sub> and NO<sub>x</sub>—are already regulated under State NSR programs for other criteria pollutants. Thus, those precursors will be subject to NSR through those other programs. Third, requiring immediate implementation of the Section 165(a)(3) air quality analysis for the PM<sub>2.5</sub> NAAQS will adequately cover the remaining gap that results from using PM<sub>10</sub> as a surrogate for PM<sub>2.5</sub>.

Upon promulgation of these rules, except in SIP-approved States which would be running a PM<sub>10</sub> program as a surrogate for a PM<sub>2.5</sub> program as stated in option 1 above, a PM<sub>2.5</sub> program would apply in attainment areas of delegated States and in nonattainment areas. Hence to avoid this imbalance, we are seeking comment on option 2 which addresses whether there is a need to update the 1997 interim policy to reflect these rules in SIP-approved States or whether we should amend Appendix S to allow these States to run a PM<sub>2.5</sub> program for PSD based on the requirements of 40 CFR 52.21 during the SIP development period in attainment areas.

Option 3 would also address this imbalance by allowing a State to request delegation of only the PSD program for PM<sub>2.5</sub> prior to the deadline for submitting a PSD SIP for PM<sub>2.5</sub>. (April 5, 2008 as discussed in the background discussion of section M16.) Because we need to allow a State enough time to submit a PSD SIP for PM<sub>2.5</sub>, we do not

believe we can unilaterally issue a FIP for the PSD PM<sub>2.5</sub> program right away. However, if a State informs EPA prior to April 5, 2008 that it does not intend to submit a PM<sub>2.5</sub> SIP, we would then have cause to issue a FIP addressing the PSD program for PM<sub>2.5</sub> and then delegate that program to the State.

#### 17. Implementation of the Nonattainment NSR Provisions During the SIP Development Period

##### a. Background

EPA interprets section 172(c)(5) of the Clean Air Act to require that States issue major NSR permits for construction and major modifications of major stationary sources in any nonattainment area. Thus, since the PM<sub>2.5</sub> nonattainment designations became effective on April 5, 2005, States are now required to issue major NSR permits that address the Section 173, nonattainment major NSR requirements for PM<sub>2.5</sub>. On the date that the PM<sub>2.5</sub> non-attainment designations took effect (April 5, 2005), we issued a guidance to address implementation of the NA NSR program pending the completion of this action to develop implementation rules for PM<sub>2.5</sub>. See memorandum from Stephen D. Page, Director, Office of Air Quality Planning and Standards to Regional Air Directors, "Implementation of New Source Review Requirements in PM<sub>2.5</sub> Nonattainment Areas" (Apr. 5, 2005).

Our current guidance permits States to implement a PM<sub>10</sub> nonattainment major NSR program as a surrogate to address the requirements of nonattainment major NSR for the PM<sub>2.5</sub> NAAQS. A State's surrogate major NSR program in PM<sub>2.5</sub> nonattainment areas may consist of either the implementation of the State's SIP-approved nonattainment major NSR program for PM<sub>10</sub> or implementation of a major NSR program for PM<sub>10</sub> under the authority in 40 CFR part 51, Appendix S. Appendix S generally applies where a State lacks a nonattainment major NSR program covering a particular pollutant.

Once this PM<sub>2.5</sub> implementation rule is finalized, States will have the necessary tools to implement a major NSR program for PM<sub>2.5</sub>. States will no longer be permitted to implement a nonattainment major NSR program for PM<sub>10</sub> as a surrogate for the PM<sub>2.5</sub> nonattainment major NSR program. Most States will then need to implement a transitional PM<sub>2.5</sub> nonattainment major NSR program under Appendix S (as amended in this rulemaking action) until EPA approves changes to a State's SIP-approved major NSR program to reflect the requirements of this rule.

The NA NSR provisions in a State's existing SIP-approved NA NSR program would only apply in areas designated nonattainment for the PM<sub>2.5</sub> NAAQS if the SIP-approved regulations contain a generic requirement to issue part D permits in areas designated as nonattainment for any criteria pollutant and do not otherwise need to be amended to incorporate the changes proposed in this rule. In the situations described below, the States will need to revise their NA NSR regulations and submit them to EPA for incorporation into the SIP by the date the new implementation plans for PM<sub>2.5</sub> are due (April 5, 2008):

- States that have nonattainment regulations that need to be amended to incorporate the new PM<sub>2.5</sub> requirements.
- States that have newly designated nonattainment areas for PM<sub>2.5</sub> and nonattainment NSR regulations that specifically list the areas in which NA NSR applies (i.e., the list does not include the newly designated areas).
- States that currently have no nonattainment areas but have newly designated nonattainment areas for PM<sub>2.5</sub>.

States in the categories listed above will have to implement a transitional major NSR permitting program for PM<sub>2.5</sub> pursuant to 40 CFR 52.24(k) and Appendix S until their existing part D SIPs are revised to meet these new PM<sub>2.5</sub> NSR regulations.

##### b. Implementation of NSR Under the Emissions Offset Interpretative Ruling (40 CFR part 51, Appendix S) With Revisions

In general, Appendix S requires new or modified major sources to meet LAER and obtain sufficient offsetting emissions reductions to assure that a new major source or major modification of an existing major source will not interfere with the area's progress toward attainment. Readers should refer to 40 CFR part 51, Appendix S for a complete understanding of these and other existing Appendix S requirements. In this action, we propose to revise Appendix S to include provisions necessary to implement a transitional major NSR program for PM<sub>2.5</sub>, including significant emissions rates applicable to major modifications for PM<sub>2.5</sub> and, as appropriate, precursors.<sup>105</sup>

As currently written, Appendix S applies directly to major stationary sources. In accordance with the requirements of Section 110(a)(2)(c) of

the Act, we believe that the majority of States have the legal authority to issue permits consistent with these requirements under an existing SIP-approved permitting program. Nonetheless, at least one State has reported that it lacks the legal authority to issue permits implementing the requirements of Appendix S under its existing permitting rules. If a State is unable to apply the requirements of Appendix S, EPA will act as the reviewing authority for the relevant portion of the permit.

We believe that it is appropriate for EPA to issue the pre-construction permits in such circumstances. As discussed earlier, Congress amended the Act in 1990 to remove the requirements that would have applied a construction ban in area's that lacked a SIP-approved part D permit program. Thus, we believe that it is consistent with Congressional intent that either the State or EPA issue permits to construct during the interim period.

##### c. Legal Basis for Requiring States To Issue Nonattainment NSR Permits During the SIP-Development Period

Section 110(a)(2)(C) of the CAA establishes a general duty on States to include a program in their SIP that regulates the modification and construction of any stationary source as necessary to assure that NAAQS are achieved. This general duty exists during all periods, including before a State has an approved NA NSR permit program.

Section 110(a)(2)(c) of the Act does not define specific requirements States must follow for issuing major source permits during the period between nonattainment designation and EPA approval of a nonattainment NSR SIP (the "SIP-development" period). However, EPA has historically recognized that the SIP development period provided under Section 172(b) of the CAA leaves a gap in part D major NSR permitting and has determined that this gap is to be filled, in general, with a transitional major NSR program that includes the LAER and offset requirements from part D. 57 FR 18070, 18076 (Apr. 28, 1992). This transitional NSR program has been implemented, to date, through the Emissions Offset Interpretative Ruling at 40 CFR part 51, Appendix S. The EPA's regulations at 40 CFR 52.24(k) require that Appendix S govern permitting during this time.<sup>106</sup>

<sup>105</sup> In a separate **Federal Register** notice, we will be revising Appendix S to incorporate changes that conform Appendix S with the minimum requirements for implementation plans that are set forth in 40 CFR 51.165.

<sup>106</sup> EPA has interpreted this requirement to require States to issue permits that are consistent with the requirements in Appendix S. We believe that many States have the authority to issue permits that are consistent with Appendix S for example,

In addition, Congress indicated in the 1977 CAA Amendments that major NSR permitting should apply during the SIP development period. See Public Law 95-95, section 129(a), 91 Stat. 685 (1977). Specifically, in 1977, when Congress enacted a moratorium on construction in any area lacking an approved part D SIP, with a delayed effective date of July 1, 1979, Congress directed that Appendix S govern permitting of sources constructing in such areas prior to that date. *Id.* section 108(b), section 129(a).

The EPA subsequently codified the use of Appendix S as the transitional major NSR program in 40 CFR 52.24(k), reasoning (in the context of implementing a delay in the construction ban for then-recently designated nonattainment areas) that Congress had directed that Appendix S remain in effect to protect air quality while State plans were being designed. 45 FR 91604 (Oct. 2, 1980). When Congress removed the construction ban (except as provided in Section 110(n)(3)), it left 40 CFR 52.24(k) in place, implementing the transitional major NSR program under Appendix S.

The continued application of appendix S through § 52.24(k) is also supported by one of the purposes of the Clean Air Act “to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare and the productive capacity of its population.” 42 U.S.C. 7401(b)(1). This provision was the basis for the original judicial finding that the Act imposed an obligation to prevent significant deterioration in areas that meet the NAAQS, prior to Congress’ enactment of the PSD program at part C of the Act.<sup>107</sup> This policy of nondegradation applies with even greater force in areas that fail to meet the NAAQS. Thus, we believe that an interim major NSR program for the SIP development period—as codified at appendix S and updated to reflect CAA amendments and the promulgation of the PM<sub>2.5</sub> NAAQS—is supported by section 110(a)(2)(C), section 101(b)(1), Congressional intent, and our gap-filling authority under section 301(a).

Although EPA omitted § 52.24(k) from the regulatory text accompanying a proposed rulemaking in 1996 (see 61 FR 38250, 38305 (July 23, 1996)), the

through State minor NSR permit programs. However, if a State lacks authority to issue a permit, then EPA will issue the permit.

<sup>107</sup> See *Alabama Power Co. v. Costle*, 636 F.3d 323, 346-047 (DC Cir. 1980) (discussing *Sierra Club v. Ruckelshaus*, 344 F. Supp. 253 (D.D.C. 1972), *aff’d per curiam* 4 ERC 1815 (DC Cir. 1972), *aff’d* by an equally divided court, *sub nom Fri v. Sierra Club*, 412 U.S. 541 (1973).

preamble indicated that the change was intended only to update and clarify the regulation with regard to the changes to the construction ban made by the 1990 Amendments.<sup>108</sup> The proposal did not in any manner indicate that EPA believed that NSR permits complying with Appendix S, or otherwise satisfying Section 110(a)(2)(C), were not required during the interim period. We have discussed the continued applicability of § 52.24(k) and Appendix S in implementation of the 8-hour ozone NAAQS. 68 FR at 32846.

#### 18. NSR Applicability to Precursors During the Interim Period

As discussed in Section M.2, EPA has proposed several options for NSR applicability to the potential PM<sub>2.5</sub> precursors (SO<sub>2</sub>, NO<sub>x</sub>, VOC, and ammonia). EPA has proposed that SO<sub>2</sub> is a national precursor to PM<sub>2.5</sub>. EPA has also proposed that if NO<sub>x</sub> emissions are subject to NSR as PM<sub>2.5</sub> precursor, States could exempt NO<sub>x</sub> from its PM<sub>2.5</sub> NSR program in a specific area by demonstrating that NO<sub>x</sub> emissions from stationary sources in that area are not a significant contributor to that area’s ambient PM<sub>2.5</sub> concentrations and the area is not in a State identified by EPA as a source of a PM<sub>2.5</sub> interstate transport problem. However, during the SIP development period, States face substantial hurdles in making such a demonstration because they are in the initial stages of gathering information and analyses necessary to prepare their attainment demonstrations. Thus, during this period, a presumption that a precursor is a regulated NSR pollutant for PM<sub>2.5</sub> may amount to an irrebuttable presumption for many States. Because of the challenges posed by the SIP development period, EPA is considering whether NSR applicability to precursors should be stayed for one or more precursors during the SIP development period. The EPA is soliciting comments on the applicability of NSR to

<sup>108</sup> The actual language at 40 CFR 52.24(k) arguably allows States to issue permits under Appendix S for a maximum period of 18 months after designation. After this time, if the nonattainment area does not have an approved NA NSR permit program, a construction ban would apply. However, in 1990, Congress altered the provisions of the construction ban such that it would not apply when a State/Local lacked an approved NA NSR permit program in the future. The EPA believes that Congress’ removal of the construction ban from the Act supersedes the regulatory language at 52.24(k) and EPA has reinterpreted this language to allow States to issue permits under Appendix S from designation until the SIP is approved even if this exceeds 18 months. See 1991 memo, “New Source Review (NSR) program Transitional Guidance, John S. Seitz, March 11, 1991. The EPA anticipates revising the language at section 52.24(k) to properly reflect this interpretation.

precursors during the SIP development period.

#### 19. Are there any Tribal concerns?

We expect that some Tribal areas will be designated as nonattainment in part because of pollution that is transported from surrounding State lands. Tribal representatives have advocated for additional flexibility to address nonattainment problems caused by transported pollution, such as the provision of NSR offset set-asides (which we expect would come from State offset pools or banks), because they have limited ability to generate offsets on their own. Tribal representatives have raised these and other concerns in discussions on implementation of the 8-hour ozone and PM<sub>2.5</sub> standards, and in comments on the 8-hour ozone implementation rule.<sup>109</sup> We request comment on whether emissions offset set-asides, possibly generated by innovative measures to promote additional emissions reductions, are an appropriate method to help level the playing field for the Tribes and support economic development in Tribal areas. We also request comment on ways in which States may help provide the Tribes access to offsets from non-Tribal areas.

In addition, to address these and other issues related to implementation of the NSR program in Indian country, EPA is evaluating the impact of the NSR program on Tribes in Indian country. The EPA plans to address these concerns in a future Tribal NSR rule.

#### 20. What must a State or local agency do about minor sources of PM<sub>2.5</sub>?

Pursuant to Section 110(a)(2)(C), States must have a minor source permitting program. This applies to new and modified stationary sources that are not considered major for a criteria pollutant or a precursor for a criteria pollutant. At this time States must include the following pollutants in their minor NSR program:

- VOC,
- SO<sub>2</sub>,
- NO<sub>x</sub>,
- CO,
- PM<sub>10</sub>, and
- Lead (Pb)

States must now amend their minor source programs to include

- PM<sub>2.5</sub> direct emissions, and
- Precursor emissions as included in PM<sub>2.5</sub> major NSR.

<sup>109</sup> 109 Letter from Bill Grantham, National Tribal Environmental Council, to docket 2003-0079, providing comments on the proposed 8-hour ozone implementation rule (66 FR 32802).



## 21. Supplemental Program Option: Rural Transport Areas

### a. What flexible implementation options should be available for Transport areas?

EPA is considering flexible implementation for Nonattainment NSR for areas that qualify for the transport classification. These areas are designated nonattainment due to overwhelming transport, for example, areas where pollution is from surrounding jurisdictions but where there are few or no sources of PM<sub>2.5</sub> in the area. Under the current program no flexibility is available under NA NSR for sources in these areas overwhelmed by transport. As mentioned earlier, in this rule, we are proposing a transport classification to provide some flexibility to address some of the fairness issues associated with transport. This transport classification can be used by States and Tribes if they meet the criteria discussed below. If there is no transport classification then this option will not be available in the near-term. However, EPA intends to develop a separate proposed rule on flexible implementation of nonattainment NSR for areas designated nonattainment for any criteria pollutant, where transport is the primary cause of the area's nonattainment. Such a proposal would not be dependent on the incorporation of a transport classification in a classification system for a NAAQS.

### b. Which nonattainment areas would be eligible for the transport program?

In order to be eligible for the transport option the State/Local with jurisdiction over a nonattainment area must:

(1) Have submitted an attainment plan which demonstrates, through modeling, that the area is designated nonattainment due to overwhelming transport from an upwind area(s); and

(2) Have submitted an attainment plan containing any additional local control measures needed for attainment of the PM<sub>2.5</sub> standard; and

(3) Have submitted the attainment plan that commits the State/Local to implement a program that meets the requirements for transport areas discussed below.

As described earlier in the classification section, an area will not be reclassified as a "transport" area until after the SIP is approved by the Regional Office. A transport area could apply for single or multi-state/Local nonattainment areas. Such areas will not be able to implement the nonattainment NSR transport program until the area is reclassified as a "transport" area. Until an area is

reclassified, States must continue to apply the nonattainment NSR program.

### c. What would be the basic requirements of a transport nonattainment NSR program?

EPA is requesting comment on what type of regulatory flexibility would be beneficial for transport areas while providing equal environmental protection. Specific examples of needed flexibility for areas which the commenter suggests would qualify as transport areas would be helpful. As noted above, we anticipate proposing a separate rulemaking on the details of the NSR requirements.

*N. How will EPA ensure that the 8-hour ozone standard will be implemented in a way which allows an optimal mix of controls for PM<sub>2.5</sub>, ozone, and regional haze?*

#### 1. Could an area's PM<sub>2.5</sub> strategy affect its 8-hour ozone and/or regional haze strategy?

Based on current data, many areas are violating both the 8-hour ozone and the PM<sub>2.5</sub> NAAQS. Thus, many cities will have ozone and PM<sub>2.5</sub> nonattainment areas with overlapping boundaries. Requirements for regional haze apply to all areas. Each State is responsible for developing SIP revisions to meet all the requirements relevant to each nonattainment area for each pollutant as well as developing a regional haze plan. In some cases, ozone control measures may also be useful for a PM<sub>2.5</sub> control strategy or a regional haze plan. Similarly, controls for PM<sub>2.5</sub> may lead to reductions in ozone or regional haze. For example, considered in isolation, a metropolitan area's ozone strategy might be based on additional VOC emissions reductions; if the area needs NO<sub>x</sub> reductions for PM<sub>2.5</sub> attainment, however, an optimal approach might include a more complex ozone strategy using both NO<sub>x</sub> and VOC reductions. We believe integration of ozone and PM<sub>2.5</sub> attainment planning will reduce overall costs of meeting multiple air quality goals.

Many of the factors affecting concentrations of ozone also affect concentrations of PM<sub>2.5</sub>. Emissions of NO<sub>x</sub> and/or VOC will lead to formation of organic particles and the precursors of particulate nitrate, as well as ozone. The presence of ozone is an important factor affecting PM<sub>2.5</sub> formation; as ozone builds up, so do hydroxyl (OH<sup>-</sup>) radicals which are instrumental in oxidizing gas phase SO<sub>2</sub> to sulfuric acid. The sulfuric acid may be converted to sulfate particles, increasing the PM<sub>2.5</sub> concentration. Further, the local ozone

concentrations may be decreased by the reaction of ozone with nitric oxide; thus, in some large urban areas, a decrease in local NO<sub>x</sub> emissions can result in higher local ozone concentrations, leading to higher OH radical concentrations and increases in secondary PM<sub>2.5</sub>. Because the precursors for ozone and PM<sub>2.5</sub> may be transported hundreds of kilometers, regional scale impacts must also be considered.

#### 2. What guidance has EPA provided regarding ozone, PM<sub>2.5</sub> and regional haze interaction?

States must develop 8-hour ozone and PM<sub>2.5</sub> attainment demonstrations for most nonattainment areas. General criteria for attainment demonstrations are contained in 40 CFR part 51, appendix W (i.e., "EPA's Guideline on Air Quality Models"). The EPA's May 1999 draft "Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-Hour Ozone NAAQS" provides a set of general requirements that an air quality model should meet to qualify for use in an attainment demonstration for the 8-hour ozone NAAQS. The draft guidance encourages States to integrate PM<sub>2.5</sub> control strategies with strategies designed to attain the 8-hour ozone NAAQS and to meet reasonable progress goals for regional haze. In addition, the draft guidance presents some modeling/analysis principles to help States develop databases and capabilities for considering joint effects of control strategies for ozone, PM<sub>2.5</sub> and regional haze. Because emissions and meteorological conditions vary seasonally, the guidance recommends assessing the effects of an ozone control strategy on annual PM<sub>2.5</sub> concentrations by estimating effects on mean PM<sub>2.5</sub> for each season and using the resulting information to estimate annual impacts. Emission estimates for VOC, NO<sub>x</sub>, primary PM<sub>2.5</sub>, SO<sub>2</sub> and ammonia will be needed. In addition, the modeling should separately estimate the effects of the ozone strategy on the major components of PM<sub>2.5</sub>: Mass associated with sulfates, nitrates, organic carbon, elemental carbon, and all other species. We believe that this approach is adequate to ensure that the 8-hour ozone standard will be implemented by States in a way that allows an optimal mix of controls for ozone, PM<sub>2.5</sub>, and regional haze.

Similarly, EPA's draft attainment demonstration guidance for PM<sub>2.5</sub> and regional haze states that models intended to address secondary PM problems should also be capable of simulating ozone formation and transport (January 2, 2001 (draft),

“Guidance for Demonstrating Attainment of Air Quality Goals for PM<sub>2.5</sub> and Regional Haze”). The formation and transport of secondary PM are closely related to processes that are important in the formation and transport of ozone. Thus, it makes sense for programs designed to control ozone to be cognizant of programs to reduce PM<sub>2.5</sub> and improve visibility and vice versa. The PM<sub>2.5</sub> guidance suggests conducting a “mid-course review” of an approved PM<sub>2.5</sub> plan to review changes in air quality resulting from implementation of plans to reduce PM<sub>2.5</sub>, regional haze, and ozone (see section E).

### 3. What is EPA proposing?

Today, we propose to continue the policy of encouraging each State with a PM<sub>2.5</sub> nonattainment area which overlaps, is near to, or otherwise affects an 8-hour ozone nonattainment area to take all reasonable steps to coordinate the required control measures needed to attain the standards in nonattainment areas and meet reasonable progress goals for regional haze. Specifically, States conducting modeling analyses for PM<sub>2.5</sub> should evaluate the concurrent effects of control strategies on estimated ozone levels. In addition, we encourage States conducting modeling analyses for ozone to estimate separately the effects of ozone control strategies on PM<sub>2.5</sub> and its precursors.

#### *O. What emission inventory requirements should apply under the PM<sub>2.5</sub> NAAQS?*

Emission inventories are critical for the efforts of State, local, tribal and federal agencies to attain and maintain the NAAQS that EPA has established for criteria pollutants including PM<sub>2.5</sub>. Pursuant to its authority under section 110 of Title I of the CAA, EPA has long required States to submit emission inventories containing information regarding the emissions of criteria pollutants and their precursors. The EPA codified these requirements in 40 CFR part 51, subpart Q in 1979 and amended them in 1987.

The 1990 CAAA revised many of the provisions of the CAA related to attainment of the NAAQS and the protection of visibility in mandatory Class I Federal areas (certain national parks and wilderness areas). These revisions established new emission inventory requirements applicable to certain areas that were designated nonattainment for certain pollutants. In the case of particulate matter, the emission inventory provisions are in the general provisions under Section 172(c)(3).

In June 2002, EPA promulgated the Consolidated Emissions Reporting Rule (CERR)(67 FR 39602, June 10, 2002). The CERR consolidates the various emissions reporting requirements that already exist into one place in the CFR, establishes new reporting requirements for PM<sub>2.5</sub> and ammonia, and establishes new requirements for the statewide reporting of area source and mobile source emissions.

The CERR establishes two types of required emission inventories:

- Annual inventories
- 3-year cycle inventories

The annual inventory requirement is limited to reporting statewide emissions data from the larger point sources. For the 3-year cycle inventory, States will need to report data from all of their point sources plus all of the area and mobile sources on a statewide basis. A special case exists for the first 3-year cycle inventory for the year 2002 which is due on June 1, 2004. The EPA has designated 2002 as the new Base Year for 8-hour ozone, PM<sub>2.5</sub> and regional haze (November 18, 2002 EPA memorandum “2002 Base Year Emission Inventory SIP Planning: 8-Hour Ozone, PM<sub>2.5</sub> and Regional Haze Programs” [http://www.epa.gov/ttn/chief/eidocs/2002baseinven\\_102502new.pdf](http://www.epa.gov/ttn/chief/eidocs/2002baseinven_102502new.pdf)).

States would estimate mobile source emissions by using the latest emissions models and planning assumptions available at the time the SIP is developed. The latest approved version of the MOBILE model should be used to estimate emissions from on-road transportation sources, in combination with the latest available estimates of vehicle miles traveled (VMT). The current version of the MOBILE model, MOBILE6.2, is used for areas outside California.<sup>110</sup> The model EMFAC2002 is used for California. The latest information on MOBILE6.2 is available at: <http://www.epa.gov/otaq/m6.htm>. The NONROAD model is currently available in draft form and can be used for estimates of non-road mobile source emissions: <http://www.epa.gov/otaq/nonrdmdl.htm>. By merging the information on point sources, area sources and mobile sources into a comprehensive emission inventory, State, local and Tribal agencies may do the following:

- Set a baseline for SIP development.
- Measure their progress in reducing emissions.

<sup>110</sup> As in the past, EPA will provide sufficient time for state and local agencies to transition to any new motor vehicle emissions factor model, if one becomes available during the development of PM<sub>2.5</sub> SIPs.

- Have a tool to support future trading programs.
- Answer the public’s request for information.

EPA uses the data submitted by the States to develop the National Emission Inventory (NEI). The NEI is used by EPA to show national emission trends, as modeling input for analysis of potential regulations, and other purposes.

Most importantly, States need these inventories to help nonattainment areas develop and meet SIP requirements to attain the annual and 24-hour PM<sub>2.5</sub> NAAQS. There is a special situation regarding emission inventories from Tribal areas that should be considered. In the past, there have been instances where portions of tribal areas have been included in designated nonattainment areas, but when the baseline emission inventory was prepared, emissions from the tribal lands were not included. This has had the effect of preventing the tribes from generating emissions reductions from existing sources to develop emission offsets, as well as impairing the ability of the State to model as accurately as possible. We are encouraging the States and Tribes to work together to ensure that the information used in developing the baseline emission inventory is inclusive of all emissions from the nonattainment area.

In April 1999, EPA published the “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,” EPA-454/R-99-006. The EPA updated this guidance in August 2005.<sup>111</sup> The current version of this guidance is available at: <http://www.epa.gov/ttn/chief/eidocs/eiguid/index.html>. The EPA developed this guidance document to complement the CERR and to provide specific guidance to State and local agencies and Tribes on how to develop emissions inventories for 8-hour ozone, PM<sub>2.5</sub>, and regional haze SIPs. While the CERR sets forth requirements for data elements, EPA guidance complements these requirements and indicates how the data should be prepared for SIP submissions. The SIP inventory also must be approved by EPA as a SIP element and is subject to public hearing requirements where the CERR is not. Because of the regulatory significance of the SIP inventory, EPA will need more documentation on how the SIP inventory was developed by the State as

<sup>111</sup> Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations,” EPA-454/R-05-001, August 2005.

opposed to the documentation required for the CERR inventory. In addition, the geographic area encompassed by some aspects of the SIP submission inventory will be different from the statewide area covered by the CERR emissions inventory. If a State's 2005 emission inventory (or a later one) becomes available in time to use for an area subsequently redesignated nonattainment, then that inventory should be used. We also encourage the cooperation of the Tribes and the State and local agencies in preparing their emissions inventories.

Therefore, the basis for EPA's emission inventory program is specified in the CERR and the related guidance document. The EPA is interested in receiving comments on whether or not additional emission inventory requirements or guidance are needed to implement the PM<sub>2.5</sub> NAAQS. For example, do any of the following issues need to be defined through additional requirements or guidance?

- An important difference between inventories submitted in response to the CERR and SIP inventories is the issue of approvability. While it is likely that an inventory submitted under the CERR would be identical to the inventory submitted as part of a SIP, the SIP inventory will need to go through public hearing and formal approval by EPA as a SIP element. This approval process can be combined with other SIP elements. Should EPA specify an inventory approval process?

- Are the data elements specified within the CERR sufficient to develop adequate SIPs? For example, in the determination of RACT should more information on existing control devices be required?

- Currently the CERR requires the reporting of SO<sub>2</sub>, VOC, NO<sub>x</sub>, CO, Pb, PM<sub>10</sub>, PM<sub>2.5</sub>, and NH<sub>3</sub>. VOC and PM are speciated by the emissions processing models based on speciation profiles for specific source categories. Is this approach sufficient, or should EPA require more specific emission component reporting such as specific organic compounds or groups of compounds or reporting of elemental carbon and organic carbon?

- The CERR allows states to adopt EPA developed emission estimates from area and mobile sources in lieu of making these estimates themselves if they accept these estimates for their emission inventory. Since 2002 has been designated as the new base year, should EPA require that States develop their own estimates for area and mobile sources?

- Are there other inventory issues that EPA should define through either regulation or guidance?

*P. What stationary source test methods should States use under the PM<sub>2.5</sub> implementation program?*

1. Will the existing stationary source test methods for particulate matter (PM) be acceptable for use in PM<sub>2.5</sub> SIPs?

We believe that states that need to adopt local control measures for primary particulate matter in nonattainment areas will need to revise their stationary source test methods. However, the acceptability of existing stationary source test methods for PM<sub>2.5</sub> SIPs depends upon what is measured under the State's current test methods for particulate matter. Information available to the Agency indicates that the majority of existing SIPs currently specify the use of stationary source test methods that quantify only filterable particulate matter. We believe that test methodologies that measure only filterable particulate matter would be acceptable in areas where no additional reductions of primary PM<sub>2.5</sub> and particulate precursor emissions are required to project attainment of the PM<sub>2.5</sub> NAAQS. The use of these existing stationary source test methods provide verification that PM<sub>2.5</sub> emissions are consistent with the levels emitted as a result of existing applicable requirements for filterable particulate matter. However, for areas where additional local control of primary particulate matter emissions are required as part of the attainment demonstration, we believe that existing test methodologies that measure only filterable particulate matter would not be acceptable. The use of existing source test methods potentially would limit the control measures available for developing cost effective strategies to achieve attainment of the PM<sub>2.5</sub> NAAQS. In addition, the existing test methods may not be acceptable for demonstrating compliance with emission limitations to achieve the PM<sub>2.5</sub> NAAQS under certain circumstances:

(1) Where the attainment demonstration includes control methodologies for PM precursors which are likely to result in a significant increase in the direct emissions of fine particulate matter (for example, ammonia injection to reduce NO<sub>x</sub> emissions).

(2) Where the attainment demonstration includes control methodologies for PM precursors which are likely to result in a significant decrease in the direct emissions of fine particulate matter (for example, alkaline

scrubbers to reduce SO<sub>2</sub> emissions) and incorporate these direct emissions reductions in their attainment demonstration or allow for the use of these reductions as credits for other programs.

2. Why are the existing stationary source test methods for PM deficient?

Most stationary source test methods specified in State rules do not adequately quantify either total PM emissions or PM<sub>2.5</sub> emissions. Additionally, some of the current stationary source test methods will not adequately provide a uniform indication of the sources' performance in controlling PM<sub>2.5</sub> emissions. Most source test methods referenced in SIPs provide a measurement of the particulate matter that is solid or liquid at a temperature specified in the method or applicable standard. Filtration temperatures of 250 °F and 320 °F are typical although other temperatures may be specified in a few test methods or applicable standards. Generally, these filterable particulate matter test methods are either identical or very similar to one of the ten Federal test methods published in Appendix A of 40 CFR Part 60 and used to determine compliance with New Source Performance Standards (NSPS). These test methods are adequate to evaluate the compliance status of a source for emissions of that component of particulate matter evaluated when the applicable rule was developed. However, these test methods do not provide a measurement of total particulate matter emissions, or PM<sub>2.5</sub> emissions.

The test method proposed to determine compliance with the first group of NSPS (36 FR 15713) determined the sum of the mass of material collected on or prior to the filters maintained at 250 °F and the material collected in the cooled impingers that followed the filter. While the material collected prior to the filter provided a measure of the filterable particulate material, the material collected in the impingers was stated to measure vapors in the stack that would become particulate matter at 70 °F (36 FR 15495). When combined, the method provided a measurement of the total particulate matter emissions from the facility tested. The promulgated test method (36 FR 24888) did not include the analysis of the impinger portion of the sampling train. To accommodate the change in the test method, EPA made adjustments in the promulgated emission limits to reflect the change in the test method. The EPA made adjustments of up to 50 percent in the promulgated emission limitations to

reflect the measurement of only the filterable portion of the emissions.

EPA recognized in setting several subsequent NSPS that the source test method used to determine compliance with the particulate matter emissions limits measured only part of the total particulate matter emitted by the applicable sources. This recognition was published on October 6, 1975, in the promulgated Revisions to Performance Testing Methods (40 FR 46250). Similarly, EPA acknowledged this in the proposal preamble to Subpart CC—Standards of Performance for Glass Manufacturing Plants (6/15/79) in the section “Selection of Performance Test Methods: The use of EPA Reference Method 5—Determination of Particulate Emissions from Stationary Sources.”

In developing the NSPS emission limitations, it is evident that only a portion of the particulate matter emissions were considered. As a result, the test methods that EPA selected for determining compliance with these emission limitations measured only that same portion of the particulate matter emissions. It was recognized that these test methods were not suitable for quantifying the total emissions to the atmosphere and that the impinger portion of the sampling train contained the missing portion of the particulate matter emissions.

On December 17, 1990, EPA promulgated Method 202 in Appendix D of 40 CFR Part 51 (56 FR 65433) to provide a method for States to use to analyze the impinger (or “back half”) content of PM emissions and provide a measure of the condensable particulate emissions. The principal procedures in Method 202 improved upon the original Method 5 back half analysis proposed in 1971. In developing this measurement method, EPA consulted with several State and local agencies and incorporated several options to simplify or accommodate existing policies and source testing methodologies for condensable particulate matter. We believe that by excluding the optional components, the use of EPA Method 202, combined with EPA Method 5 or EPA Method 17, provides a reasonable indication of total particulate matter emissions for the majority of stationary emission sources.

However, the combination of EPA Method 5 and Method 202 measures particulate matter that is larger than 2.5 micrometers in aerodynamic diameter, and will not provide a reasonable measurement of the emissions of PM<sub>2.5</sub>. Methods are available that can separate particulate matter by aerodynamic size. On April 17, 1990, EPA promulgated EPA Method 201 and Method 201A to

provide a source test method that separated filterable particulate matter greater than 10 micrometers from filterable particulate matter equal or smaller than 10 micrometers. The single cyclone used in these methods replaced the nozzle of EPA Method 17 to separate the two size classes of filterable particulate. This method allows sources to determine their emissions of filterable PM<sub>10</sub> when there are size specific emission limits or when there is a need for size specific emission inventories. With the addition of a second smaller cyclone following the single cyclone of EPA Method 201A, the filterable particulate can be separated into three size classifications. These classifications include filterable particulate matter greater than 10 micrometers, filterable particulate matter equal or smaller than 10 micrometers but greater than 2.5 micrometers, and filterable particulate matter equal or smaller than 2.5 micrometers. This method is posted as Conditional Method 40 (CTM 40) on EPA’s Emission Measurement Centers web page at <http://www.epa.gov/ttn/emc/ctm.html>. Of the methods mentioned previously, the most reliable measurement of total direct PM<sub>2.5</sub> emissions would combine the use of Conditional Method 40 with EPA Method 202.

Conditional Method 40 has been used at several facilities in the U.S. and the hardware required to implement this method has been readily available since the mid-1980’s. The acceptability of a source using the existing SIP test methods for filterable particulate matter as an indication of the source’s relative performance in controlling PM<sub>2.5</sub> emissions would depend on the source’s level of condensable particulate matter emissions in relation to filterable PM emissions, the proportion of filterable particulate matter that is smaller than 2.5 micrometers, the add-on PM control device effectiveness, and the need to consider limiting the emissions of the condensable material. In areas where there is no need to reduce stationary source particulate matter emission levels to demonstrate attainment of the PM<sub>2.5</sub> NAAQS, the use of total filterable particulate test methods may be adequate to insure that existing levels of PM control are being maintained. However, in areas where a reduction of stationary source particulate matter emissions is incorporated into the attainment demonstration, the use of a test method that measures total PM<sub>2.5</sub> emissions would be more appropriate than existing test methods that measure only total filterable PM.

3. If the stationary source test methods are changed, will the existing emission limitations incorporated in SIPs need to be changed?

Changes in the source test method will require reevaluations of the emission limitations. The reevaluation will need to consider the interrelated impacts due to differences in the test method, characteristics of the particulate matter emissions from the sources, and intended changes in the stringency of the emission limitations. The following three examples provide a range of the relationships that can occur between the source test method and the characteristics of the particulate matter emissions. For sources with no condensable particulate matter emissions, a change from a total particulate matter test method (using the same particle size cutoff) to a PM<sub>2.5</sub> test method will result in lower measured emissions. The difference in mass measured by the two test methods depends on the size distribution of the filterable particulate matter emissions from the source. For sources with condensable particulate matter emissions, a change from a filterable particulate matter test method to a total particulate matter test method will result in higher measured emissions. The difference in mass measured by the two test methods depends on the relative emissions of filterable and condensable emissions from the source. For sources with condensable particulate matter emissions, a change from a total filterable particulate matter test method to a total PM<sub>2.5</sub> test method may increase or decrease the measured emissions. The increase or decrease and the magnitude of any change would depend on the particle size distribution of the filterable particulate matter and the magnitude of the condensable particulate matter emission.

As can be inferred from these three examples, the application of a single multiplier to convert existing emission limitations to a total PM<sub>2.5</sub> emission limitation would result in a variable change in the stringency of emission limitation. The use of a single multiplier would result in unplanned and variable changes in the stringency in the existing emission limitations. These changes may create unintended consequences for the affected sources and result in poorly understood and quantified estimates of the benefits.

4. The existing PM test methods and the emission limits based upon these methods have been acceptable since 1971, why do they need to be changed for PM<sub>2.5</sub>?

Several changes have occurred over the last 30 years that have gradually eroded the predictive capabilities of particulate matter source test methods used in most SIPs to evaluate the sources performance in controlling the pollutant measured by the ambient air quality test method. In the 1970's and early 1980's, the ambient air quality test method quantified the total particulate matter suspended in the ambient air. At the beginning of this period, particulate matter control measures were relatively poor. Additionally, most of particulate matter control measures applied over the last 30 years have focused on filterable particulate matter. While some control measures for other air pollutants also resulted in collateral reductions in condensable particulate and particulate precursor emissions, these reductions were relatively small. As a result, the relative amount of sulfates, nitrates and condensed organic matter in the ambient air particulate matter was proportionally greater in the 1980's than it was in the 1970's. The promulgation of the PM<sub>10</sub> NAAQS in 1987 resulted in further reductions in filterable PM from sources, but there were few non-attainment areas where control of the condensable constituents of PM<sub>10</sub> was required in order to achieve attainment. As a result, stationary source control measures that addressed only the filterable component of particulate matter were generally adequate to achieve the PM<sub>10</sub> NAAQS.

With the promulgation of the PM<sub>2.5</sub> NAAQS in 1997 and associated ambient air quality monitoring, speciation analyses of PM<sub>2.5</sub> show that a substantial portion of PM<sub>2.5</sub> consists of sulfates, nitrates and organic carbon. These constituents are also a substantial portion of the condensable particulate matter collected from stationary sources. With the increased application of increasingly efficient filterable particulate matter control measures, condensable emissions have become a larger percentage of overall PM<sub>2.5</sub> emissions for several stationary source categories.

Based upon the particle size distribution presented in Table 1.1–6 of AP–42, about 29 percent of the total filterable particulate matter is filterable PM<sub>2.5</sub>. As a result, about 78 percent of the total PM<sub>2.5</sub> emissions would be condensable PM.<sup>112</sup> Since filterable

particulate matter emissions controls have improved since 1971 and since most sources achieve substantially lower emissions than required by State and Federal emissions limitations, and condensable emissions have generally not been significantly reduced, the significance of the condensable emissions as a proportion of direct PM<sub>2.5</sub> emissions may be greater than indicated above. A test method that measures total filterable particulate matter, commonly including mostly particles larger than PM<sub>2.5</sub> and yet excluding condensable emissions, is a poor indicator of source performance at reducing PM<sub>2.5</sub> emissions.

5. What methods are available for measuring PM size and condensable PM from stationary sources?

EPA has adopted one of several methods that are available for classifying particulate matter by aerodynamic diameter. The method adopted is based upon the use of centrifugal forces created in cyclones to separate particulate matter into two aerodynamic size classifications. The cyclone specified in EPA Method 201 and 201A separates particulate matter with a nominal aerodynamic diameter greater than 10 micrometers from the remaining particulate matter. The addition of a second smaller cyclone following the EPA Method 201A cyclone as is specified in EPA Method CTM 40 separates the particulate matter that has an aerodynamic diameter greater than 2.5 micrometers from the remaining particulate matter. A filter follows the final cyclone of these particle sizing methods to collect the smaller material. Under EPA's source test methods to separate PM based on particle size, both of the cyclones and the filter are maintained at the flue gas temperature. Therefore, any material that is in a vapor state in the flue gas but would be condensed as a result of dilution and cooling when released to the ambient air will not be measured by these particle sizing methods.

Vapors that would condense to form particulate matter in the ambient air can be quantified by EPA Method 202. The EPA Method 202 is intended for use in conjunction with a filterable particulate

matter test method such as Method 201A or CTM 40. Impingers containing cold water are used by most methods to condense water vapor for determining the flue gas moisture content. Besides condensing water vapor in the flue gas, organic and inorganic chemical vapors are also condensed in these impingers. In EPA Method 202, the organic and inorganic vapors condensed in the impingers are separated with an organic solvent and weighed after evaporating the water and organic solvent used for separation.

As recommended by the National Academy of Sciences, EPA and others are developing dilution based source test methods for collecting and analyzing PM<sub>2.5</sub>. Rather than condensing vapors in chilled water, cool filtered dilution air condenses the vapors prior to collection on filters. In the new method developed by EPA, particulate matter is sized using the same cyclones used in CTM 40. However, the in-stack filter used in CTM 40 is removed so that all of the PM<sub>2.5</sub> particulate matter is collected at near ambient temperature on the filters.

6. Why is a new dilution-based test method being developed by EPA?

The use of dilution-based particulate matter sampling offers several advantages over the combination of EPA Method CTM 40 and Method 202. One advantage is that the vapors are condensed and chemical reactions occur in a manner similar to when stack gas is released to the atmosphere. As a result, the potential for particulate matter formation that may occur in water but would not occur in air is eliminated. Another advantage is that the potential for losing particulate matter during the evaporation of the impinger water is eliminated. With the use of multiple filter types, the use of dilution sampling methods will allow for the speciation of the collected PM<sub>2.5</sub> by the same methods used for speciation of ambient air particulate matter. Additionally, dilution-based methods allow for the measurement of the particle size distribution of the particulate matter smaller than 2.5 micrometers. This can be accomplished by modifying the hardware of the sampling equipment to extend the residence time of the sampled particulate matter. The extra residence time allows the ultrafine particulate matter initially formed during vapor condensation to grow toward its ultimate particle size distribution.

<sup>112</sup> The significance of the condensable fraction of PM<sub>2.5</sub> is illustrated using the original supporting

data for the Subpart D NSPS cited previously. The promulgated standard was reduced by 50% because about half the emissions were filterable PM and the other half were condensable PM. However, only about 29 percent of the filterable particulate matter is filterable PM<sub>2.5</sub> (based upon the particle size distribution presented in Table 1.1–6 of AP–42). Therefore, about 78 percent of the total PM<sub>2.5</sub> emissions would be condensable PM {Total PM = 0.5 filterable + 0.5 condensable, Total PM<sub>2.5</sub> = (0.5 filterable × .29) + 0.5 condensable = 0.645, condensable PM<sub>2.5</sub> = 0.5/0.645 = 78%}.

7. What types of sources should use the new dilution-based test method?

The new dilution-based test method would be appropriate for most sources. Sources with very complex flue gas characteristics (e.g., having several acidic and alkali gases with semi-volatile organic matter) and those sources that want to generate a speciation profile specific to their facility should use the new dilution test method. Sources with very low PM<sub>2.5</sub> emission concentrations and low SO<sub>2</sub> and NO<sub>x</sub> emission concentrations also may wish to use the new dilution method. However, the more complex operation and increased size of the equipment associated with the new method may persuade some sources to use an alternative method. Sources where the flue gas is near ambient temperature or where the sampled gas can be cooled to near ambient temperature could use CTM 40 or its equivalent to quantify PM<sub>2.5</sub> emissions. Sources with less complex flue gas characteristics may want to use CTM 40 combined with EPA Method 202.

8. What are the main features of the new test method?

The main features of the new test method are in the areas of sample extraction, particle sizing, sample flow rate measurement, dilution air conditioning, dilution air flow rate measurement, sample mixing with dilution air and sample filtration. An additional major feature, where particulate speciation is desired, is the method of extracting an aliquot of the diluted sample. Flue gas is extracted isokinetically at a flow rate that produces particulate matter sizing at 10 and 2.5 micrometers by the two in-stack cyclones. The sampled flue gas and the PM<sub>2.5</sub> particulate matter is extracted from the stack prior to dilution and cooling with ambient air that has been conditioned by removing excess moisture and ambient particulate matter with a HEPA filter. The objective of all the methods is to achieve complete mixing prior to filtration and to minimize sample losses on the internal surfaces of the hardware. The PM<sub>2.5</sub> is removed from the diluted sample gas by a Teflon filter. The PM<sub>2.5</sub> deposited on the internal surfaces of the hardware is quantitatively recovered with acetone. Both the Teflon filter and the PM<sub>2.5</sub> recovered from the internal surfaces of the sampler are weighed. When speciation of the PM<sub>2.5</sub> is desired, aliquots of the diluted sample gas are extracted for collection on filters. The ambient air speciation criteria are followed with respect to the filter media

used and analytical finish of the three filters.

9. What is the schedule for finalization of the new test method?

We have posted the dilution-based PM<sub>2.5</sub> source test method on the TTN web as "Conditional Test Method 39" and expect that this method will provide the basis for a 40 CFR Part 51, Appendix M method to be proposed at a later date. Beyond proposing the EPA-developed dilution test method, we may identify the use of a source test method developed by a national voluntary consensus standard setting organization. Public Law 104-113, also known as the National Technology Transfer and Advancement Act (NTTAA), requires that we use technical standards that are developed or adopted by voluntary consensus standards bodies as a means to carry out policy objectives where appropriate. The law also requires us to consult with such bodies when it is in the public interest to participate with them in the development of technical standards. Recently, the ASTM Source and Ambient Atmospheres Committee developed a PM<sub>2.5</sub> source test method similar to the method we have developed. We believe that it is in the interest of the public and the Agency to participate in the ASTM process of developing a PM<sub>2.5</sub> source test method. While we cannot predict when an ASTM standard will be available and whether it will be a suitable test method for EPA to specify for use in SIPs, we expect to make a decision on the final test method in the near future. We are aware of two manufacturers which have commercially available equipment meeting the specifications of CTM-39 and the draft ASTM certification.

10. How will use of this new method affect an areas emissions inventory and the emissions inventory for individual sources?

We do not expect that particulate matter emissions inventories will be significantly affected by the use of this new test method. The stationary source emissions of PM<sub>2.5</sub> are based upon existing filterable particulate matter size distributions and filterable and condensable particulate matter emission factors. The emission factor information is supported by source test data similar to that available from EPA Method CTM-40 and Method 202. However, it is unclear how the use of the new dilution sampling method will affect the PM<sub>2.5</sub> emission inventory for any particular source category. Source categories for which emission estimates for condensable particulate matter are not available or are under estimated

may find that the inventoried emissions are significantly higher. As indicated previously, the addition of the condensable portion of PM<sub>2.5</sub> to filterable PM<sub>2.5</sub> may increase direct PM<sub>2.5</sub> emissions by a factor of five or more. Source categories for which the condensable particulate matter emission factor is based on EPA Method 202 test data that excludes the nitrogen purge may find that their emissions are somewhat lower. The significance of this lower mass of condensable particulate matter depends on the mass of filterable and condensable particulate matter compared to the mass of particulate artifact formed by the dissolved SO<sub>2</sub> that was not removed from the impinger water by the nitrogen purge.

11. How will use of this new method affect a State's implementation program more broadly?

The use of this new dilution method (or the use of EPA Method CTM 40 combined with Method 202) to obtain measured source specific emissions of PM<sub>2.5</sub> will improve the quality of the emissions inventory for stationary sources and will aid in the development of a more reliable attainment strategy. In addition, we expect the use of the speciation capabilities of this new source test method will expand the information available to formulate attainment demonstration strategies and to justify the most effective strategy. For example, this new source-specific speciation data may allow the State to identify additional local control measures for consideration. The combined information from the ambient air speciation network and individual source category speciation data will aid in developing the most efficient attainment strategies. In addition, after initial attainment strategies are implemented, speciation profiles for the most significant sources of direct PM<sub>2.5</sub> combined with data from the ambient monitoring network may enable States to make important mid-course revisions to attainment strategies as needed.

*Q. How can potentially inadequate source monitoring in certain SIP rules be improved?*

1. How Does Improved PM<sub>2.5</sub> Monitoring Relate to Title V Monitoring?

Two provisions of EPA's State and federal operating permits program regulations require that title V permits contain monitoring requirements. The "periodic monitoring" rules, 40 CFR 70.6(a)(3)(i)(B) and 71.6(a)(3)(i)(B), require that:

“[w]here the applicable requirement does not require periodic testing or instrumental or noninstrumental monitoring (which may consist of recordkeeping designed to serve as monitoring), [each title V permit must contain] periodic monitoring sufficient to yield reliable data from the relevant time period that are representative of the source’s compliance with the permit, as reported pursuant to [§ 70.6(a)(3)(iii) or § 71.6(a)(3)(iii)]. Such monitoring requirements shall assure use of terms, test methods, units, averaging periods, and other statistical conventions consistent with the applicable requirement. Recordkeeping provisions may be sufficient to meet the requirements of [§ 70.6(a)(3)(i)(B) and § 71.6(a)(3)(i)(B)].”

The “umbrella monitoring” rules, §§ 70.6(c)(1) and 71.6(c)(1), require that each title V permit contain, “[c]onsistent with paragraph (a)(3) of this section, compliance certification, testing, monitoring, reporting, and recordkeeping requirements sufficient to assure compliance with the terms and conditions of the permit.”

In a final rule entitled “Revisions to Clarify the Scope of Certain Monitoring Requirements for Federal and State Operating Permits Programs” (69 FR 3202, January 22, 2004), EPA announced a four-step strategy for improving existing monitoring where necessary through rulemaking or other programmatic actions, while reducing resource-intensive, case-by-case monitoring reviews and so-called “gap-filling” in title V operating permits. Improved PM<sub>2.5</sub> monitoring, as discussed in this preamble and to be addressed in future guidance, is part of that strategy.

In the first step, the “umbrella monitoring” rule (69 FR 3202, January 22, 2004), EPA decided not to adopt proposed revisions to the regulatory text of §§ 70.6(c)(1) and 71.6(c)(1) (67 FR 58561, September 17, 2002) and instead ratified the text of those rules without making any changes. The EPA also announced that notwithstanding the recitation in §§ 70.6(c)(1) and 71.6(c)(1) of monitoring as a permit element, EPA has determined that these provisions do not establish a separate regulatory standard or basis for requiring or authorizing review and enhancement of existing monitoring independent of any review and enhancement as may be required under §§ 70.6(a)(3) and 71.6(a)(3). The EPA explained that §§ 70.6(c)(1) and 71.6(c)(1) require that title V permits contain: (1) Monitoring required by “applicable requirements” under the Act, as that term is defined in §§ 70.2 and 71.2<sup>113</sup>; and (2) such

monitoring as may be required under §§ 70.6(a)(3)(i)(B) and 71.6(a)(3)(i)(B). See *Appalachian Power Co. v. EPA*, 208 F.3d 1015 (DC Cir. 2000). Thus, for monitoring, EPA explained, §§ 70.6(c)(1) and 71.6(c)(1) constitute “umbrella provisions” that direct permitting authorities to include monitoring required under existing statutory or regulatory authorities in title V permits. Based on EPA’s interpretation of the Act, the plain language and structure of §§ 70.6(c)(1) and 71.6(c)(1) and the policy reasons described in the preamble to the umbrella monitoring rule (see 69 FR at 3204), EPA concluded that where the periodic monitoring rules do not apply, §§ 70.6(c)(1) and 71.6(c)(1) do not require or authorize a new and independent type of monitoring in permits in order for the permits to contain monitoring to assure compliance as required by the Act.

In the “umbrella monitoring” rule, EPA also announced plans to address monitoring in three related rulemaking actions. First, EPA announced plans to encourage States to improve potentially inadequate monitoring in certain SIP rules through this preamble and specifically through separate guidance to be developed later in connection with this rulemaking. The guidance is expected to describe methods of improving monitoring frequency or adopting more appropriate monitoring for States to consider in developing their PM<sub>2.5</sub> SIPs and to illustrate the amount of credit that States could receive in PM<sub>2.5</sub> SIPs for adopting such improved monitoring. In particular, the guidance is expected to address the widespread practice of using visual techniques, such as visible emissions checks, to show compliance with particulate matter limits. As discussed in section Q.2 below, we are concerned that visible emissions techniques may be inadequate to detect PM<sub>2.5</sub> emissions in some circumstances. To the extent that States implement this PM<sub>2.5</sub> guidance and revise their SIPs to adopt improved monitoring, then further actions by the State or EPA to bring an area into attainment may be unnecessary.

In addition, EPA announced plans to identify and consider improving potentially inadequate monitoring in certain federal rules or in SIP rules not

compliance assurance monitoring (CAM) rule, 40 CFR part 64, where it applies; monitoring required under federal rules such as new source performance standards (NSPS) in 40 CFR part 60, national emissions standards for hazardous air pollutants (NESHAP) in 40 CFR part 61, maximum achievable control technology (MACT) standards in 40 CFR part 63, and the acid rain program rules in 40 CFR parts 72 through 75; and monitoring required in EPA-approved SIP, TIP and FIP rules.

addressed in connection with the PM<sub>2.5</sub> implementation guidance or rulemaking over a longer time frame. Specifically, EPA announced its intent to publish an advance notice of proposed rulemaking requesting comment on what inadequate monitoring may exist in federal applicable requirements and seeking suggestions as to the ways in which inadequate monitoring in such rules could be improved. EPA also announced its intent to request comment on inadequate monitoring that may exist in other rules, such as SIP rules not addressed in connection with this PM<sub>2.5</sub> rulemaking and guidance. The EPA indicated that comments received on the ANPR will inform its decision as to what steps to take next, such as whether to undertake national rulemakings to revise federal rules such as NSPS or NESHAP. Finally, EPA announced plans to publish a separate proposed rule to address what monitoring constitutes “periodic” monitoring under §§ 70.6(a)(3)(i)(B) and 71.6(a)(3)(i)(B) and what types of monitoring should be created under §§ 70.6(a)(3)(i)(B) and 71.6(a)(3)(i)(B). Together with the umbrella monitoring rule, these three related rulemaking actions comprise EPA’s four-step strategy for improving existing monitoring where necessary on a programmatic basis.

## 2. Are Instrumental Techniques More Appropriate Than Visual Emissions (VE) Techniques for Monitoring Compliance With PM Emissions Limits, for Some Situations and Applications?

We have a concern about the reliance on VE techniques (which are based on observations of visible emissions or opacity) for monitoring compliance with particulate matter emissions limits, in certain situations. For example, in situations where a facility has a low margin of compliance with its emission limit [e.g., the emission limit is 25 milligrams of PM<sub>2.5</sub> per dry standard cubic meter (mg/dscm) and actual emissions are 22.5 mg/dscm, leaving a margin of compliance of 2.5 mg/dscm], VE monitoring may not provide the level of sensitivity necessary to monitor compliance. We also have a concern about the infrequency of the monitoring sometimes associated with the use of these VE monitoring techniques. Although visible emissions and the opacity of visible emissions are indicators of a change in PM emissions levels, we believe the use of available instrumental monitoring technologies that provide a more direct measure of the pollutant of concern, PM<sub>2.5</sub>, constitute improved monitoring techniques and are the more appropriate

<sup>113</sup> The term “applicable requirements” includes, but is not limited to: monitoring required under the

method in many cases. These instrumental techniques include bag leak detectors (BLD), and particulate matter continuous emissions monitoring systems (PM CEMS). In this proposal, we are encouraging States to adopt improved monitoring techniques for PM<sub>2.5</sub> in their SIPs, and we plan to show, via separate guidance, how States can improve emissions reductions and therefore increase credits in their SIPs if they adopt the improved monitoring for selected sources. See the discussion above in section I.17 for potential ways to obtain emissions reductions through improved monitoring or controls. Note that the improved monitoring techniques may also be appropriate for sources with PM<sub>10</sub> emissions.

With respect to the frequency of VE monitoring, we believe more frequent monitoring will reduce the potential for excess emissions to occur unnoticed and, thus, will minimize the duration of excess emissions periods. An example is the monitoring of VE from a fabric filter control device utilizing weekly visual observations. The potential exists for excess emissions to occur during the entire period between observations, or up to seven days. Increasing the frequency of observations to a daily basis significantly reduces the potential duration of any excess emissions period. For example, consider an emissions unit controlled with a fabric filter that emits 15 tons per year PM<sub>2.5</sub> (filterable), and has no visible emissions during normal operation. For the baseline condition, assume an excess emissions rate of 5 percent. By increasing the frequency of observations from a weekly to a daily basis, the exceedences are observed and corrective action and repair are taken in a more timely manner; the resulting emissions reduction ranges from 11 to 13 tons per year filterable PM<sub>2.5</sub>, or 37 to 81 percent reduction of the potential excess emissions.<sup>114</sup> If the potential emissions reduction for filterable PM<sub>10</sub> also is considered, the PM reductions would include an additional 6.3 to 8.0 tons per year depending on the calculation method used.

With respect to improved monitoring techniques for PM<sub>2.5</sub>, we believe currently available instrumental techniques are more capable of detecting changes in performance of the control device than visual observations or COMS, in some applications, such as at low emissions levels sometimes required for compliance with PM<sub>2.5</sub> emissions limits. Furthermore, unlike

periodic visual observations, these instrumental techniques provide information on a continuous basis. Consequently, we believe use of these instrumental techniques can reduce the occurrence of excess emissions because (1) they are capable of sensing a change in performance that might not be sensed by a visual technique and (2) when excess emissions occur, the duration of excess emissions will be reduced as a result of the frequency of monitoring. An example of an improved monitoring technique is the use of a BLD to monitor PM<sub>2.5</sub> emissions from a fabric filter control device in lieu of weekly visual observations. Consider a model emissions unit emitting 15 tons per year PM<sub>2.5</sub> (filterable). For the baseline condition, assume an excess emissions rate of 5 percent. By using a continuous instrumental technique, such as a BLD, rather than weekly visual observations, the emissions from potential excess emissions events would be reduced by 11 to 14 tons per year of filterable PM<sub>2.5</sub>. If the potential emissions reduction for filterable PM<sub>10</sub> also is considered, the PM reductions would be an additional 6.8 to 8.5 tons per year.<sup>115</sup>

Use of a PM CEMS is another improved monitoring technique. PM CEMS technology provides the opportunity to quantitatively monitor PM emissions levels (concentration or emissions rates). This provides the source owner/operator with an additional level of information that can be useful for understanding and operating the process and air pollution control device. Furthermore, this technology will provide the State with quantitative information on actual PM emissions, which will help improve the inventory and achieve compliance with the NAAQS for PM<sub>2.5</sub>.

To inform our guidance development, we are asking for comment, information, and relevant data on these monitoring issues. Specifically:

(1) In certain instances or applications, are we correct in our belief that improved monitoring techniques are available and are more appropriate to use than VE techniques for monitoring compliance with PM<sub>2.5</sub> emissions? Based on your experience, in which cases do you believe improved monitoring techniques are more appropriate than VE techniques for monitoring compliance with PM<sub>2.5</sub> (or PM, in general) emissions limits, and what monitoring techniques would you recommend? Based on your experience, are BLD and PM CEMS reliable, cost-effective methods that are more sensitive than VE techniques for

monitoring compliance with PM emissions?

(2) Will increasing the frequency of VE observations resolve the issue of applicability of VE techniques for monitoring compliance with PM<sub>2.5</sub> emissions? In other words, are there situations in which increased VE frequency (*i.e.*, daily versus weekly) would be expected to have no impact on compliance with PM<sub>2.5</sub> emission limits? If so, please provide relevant data and explanation of such situations.

(3) Do we need to mandate through rulemaking a move away from VE techniques for monitoring compliance with PM<sub>2.5</sub> and PM emissions limits, in certain situations and applications? If so, in what cases?

(4) Should our effort with regard to the use of improved monitoring techniques in lieu of VE monitoring be focused on applicable requirements established/relied upon for compliance with the PM<sub>2.5</sub> standard, or should we more broadly address other applicable requirements where VE techniques are commonly used (*e.g.*, TSP, PM<sub>10</sub>)?

In addition, we also request comment, information, and relevant data on any other issues relating to the use of VE techniques for monitoring compliance with particulate matter emission limits.

### 3. What constitutes improved monitoring?

Additional Reductions from Existing Rules. We request comment on the following approach that States may choose to implement to reduce emissions through the improved monitoring of emission controls at stationary sources. An improved monitoring control measure would increase emissions reduction for existing rules. These emissions reductions would be achieved by increasing the monitoring frequency or improving the monitoring technique of the add-on air pollution control device operation and the process operation above the level currently required in existing rules. The increased frequency or improved technique would allow owners or operators to achieve greater emissions reductions by identifying and correcting periods of excess emissions. State, local, and Tribal agencies could use the improved monitoring control measure option to reduce emission levels and receive credits. As described in the docket, State, local, and Tribal air pollution agencies who have source owners/operators increase monitoring frequency at their facilities could achieve emissions reductions up to 13 percent, and those who improve the monitoring technique could achieve emissions reductions up to 15

<sup>114</sup> "Impact of Improved Monitoring on PM<sub>2.5</sub> Emissions," memorandum from L. Barr and K. Schaffner, RTI International, to B. Parker, U.S. Environmental Protection Agency. December 2003.

<sup>115</sup> *Ibid.*



percent.<sup>116</sup> Nonattainment areas where additional reductions are needed to help the area achieve compliance with the NAAQS could implement an improved monitoring measure. State, local, and Tribal air pollution agencies could set a size cutoff or other criteria that would define which facilities would be subject. State, local, and Tribal agencies could receive SIP credits because enforceable improved monitoring or voluntary programs meeting EPA's voluntary policies for SIP credit could achieve additional emissions reductions for facilities in the area.

Improved monitoring could come in the form of (1) conducting the currently required monitoring more frequently (i.e., increased monitoring frequency), (2) changing the monitoring technique to a parameter more closely related to PM<sub>2.5</sub> and its precursors (i.e., an improved monitoring technique), (3) changing the technique to monitoring PM<sub>2.5</sub> and its precursors, or (4) a combination of these improvements. These types of monitoring improvements could be conducted for both controlled and uncontrolled emission units. The improved monitoring control measure would require facilities to pay more attention to the operation of add-on air pollution control devices and the process operation. The additional attention will reduce excess emission periods and increase emissions reductions for existing rules.

For the purposes of discussion today, we are focusing on two scenarios. The first scenario involves increased monitoring frequency for controlled emission units. The second scenario incorporates improved monitoring techniques that include upgrading to a bag leak detector (BLD) monitoring device and upgrading to a PM continuous emissions monitoring system (CEMS) for controlled emission units.

As an example of improved monitoring, consider a facility that currently monitors for visible emissions once per day voluntarily increasing its monitoring frequency of visible emissions to once per hour, or installing a BLD system that continuously monitors the control device. Under the improved monitoring control measure, the source owners/operators would be more likely to detect the presence of a problem and to correct it more quickly. Expedient detection and correction of problems will result in reduced periods

of excess emissions and, consequently, lower emissions. The increased monitoring frequency works to reduce the time between equipment failure and its discovery by plant personnel. The underlying assumption is, of course, that faster discovery leads to faster correction.

The improved monitoring technique provides more certainty in detecting the presence of a problem that may have gone unnoticed with the previous technique. For example, consider a facility that monitors opacity with a COMS as a surrogate for particulate matter. The facility's opacity, as measured by the COMS, is consistently at 10 percent. However, emissions test data have shown that, when a new BLD monitoring system is applied, the facility can be exceeding its PM limit at an opacity less than 10 percent. In this example, application of an improved monitoring technique provides a more direct and more sensitive measurement of the pollutant of concern (PM vs. opacity) and allows the facility to better track performance of the control device and its emissions levels.

In addition to the improved monitoring measures, there are other ways to achieve significant PM<sub>2.5</sub> emissions reductions, including requiring add-on air pollution controls for uncontrolled emissions units that are capable of being controlled. In this type of approach, State, local, and Tribal agencies could require large uncontrolled emission units to be controlled with new air pollution control devices. Fabric filters would control filterable PM<sub>2.5</sub> emissions while other control devices such as scrubbers would control both filterable and condensable PM<sub>2.5</sub> emissions. In one example for a large uncontrolled unit, PM<sub>2.5</sub> emissions (filterable) may be reduced by 131 tons per year when a fabric filter achieving 99 percent control efficiency is installed. The cost effectiveness to install this new control device would be determined based on the annualized cost of operating the fabric filter and the emission reduction of PM<sub>2.5</sub> achieved by the device. If co-controlled pollutants are included in the analysis, e.g., PM<sub>10</sub> filterable emissions, then the emissions reductions achieved by the new fabric filter would include an additional 260 tons per year. The total emission reduction for this source would be 390 tons per year; the cost-effectiveness values with collateral benefits included will be even lower. The fabric filter in this example would be monitored with a BLD system on a continuous basis (at least four times per hour).

What are the Assumptions Used to Determine the Reductions? We estimated the emissions reductions that can be achieved by implementation of the improved monitoring measures. Consistent with the baseline excess emissions rate established in the compliance assurance monitoring (CAM) rule (40 CFR part 64) analysis, we assumed an initial excess emissions rate of five percent each year. Under the NSPS and other federal rules, an excess emissions rate greater than five percent is a trigger for increased reporting, and facilities generally ensure that they do not exceed this threshold level of excess emissions to avoid increased reporting. Of course, there may be exceptions to this assumption, where facilities have excess emissions rates greater than 5 percent. The percentage of excess emissions represents a period of noncompliance when emissions are likely to be above the allowable emissions rates. Increased frequency monitoring will help owners or operators of facilities to maintain the effectiveness of emissions controls by identifying excursions early and repairing or adjusting the control device immediately. The length of time that an emissions unit is experiencing excess emissions is directly related to the level of excess emissions from the source. Reducing the amount of time the emission unit operates in this mode will reduce its actual emissions to the atmosphere.

In this study, we made two assumptions regarding the control efficiency of the add-on air pollution control device during excess emissions periods. In one method, we assumed the control device fails catastrophically; that is, its control efficiency is zero percent. We realize that some add-on air pollution control devices fail catastrophically during malfunctions, while others operate at some efficiency less than optimal but greater than zero. For the purposes of the study and for simplification, we made the assumption of zero percent control in this method. The control efficiency could also be estimated at some value between zero and the design control efficiency. In an alternative method, the control efficiency during excess emissions periods was estimated to be 80 percent of the design efficiency.

The potential emissions reductions examined here mostly address direct, filterable PM<sub>2.5</sub> and also address condensable PM<sub>2.5</sub> only where the control device was likely to achieve reductions for condensable emissions. Additional emissions reductions may also be achieved for co-pollutants emitted from the emissions units. We

<sup>116</sup> "Impact of Improved Monitoring on PM<sub>2.5</sub> Emissions," memorandum from L. Barr and K. Schaffner, RTI International, to B. Parker, U.S. Environmental Protection Agency. December 2003.

believe that control for these other pollutants, e.g., PM<sub>10</sub>, TSP, and HAP, may also be improved by the monitoring measures. However, these improvements are not accounted for here. Improved monitoring, i.e., increased frequency for existing monitoring instruments or improved monitoring techniques, could also be applied to the precursors of PM<sub>2.5</sub> to achieve additional potential reductions.

The improved monitoring control measure would increase emissions reductions for existing rules. The emissions reduction achieved would not necessarily be reflected in future emissions inventory data but rather would be reflected in lower ambient air monitoring concentrations.<sup>117</sup> In assessing emissions from a particular facility, we generally assume 100 percent compliance for 100 percent of the operating time. However, excess emissions occur as a result of less than full compliance with standards, rules, and regulations. For example, a facility with an air pollution control device designed to achieve a 95 percent control efficiency will achieve the design efficiency if maintained and operated properly. Currently, the owner or operator of such a facility would conduct a prescribed monitoring technique (control device parameter, process parameter, or pollutant concentration) at a prescribed frequency. Operation outside of limits set for the monitored parameter(s) is an excursion for CAM rule purposes (and may be an exceedance for other rules) and may be an indication of excess emissions.

In accordance with CAM rule requirements, we assumed that facilities are currently required to monitor add-on control devices of applicable emission units at least once per day. With this approach, we ensure that the emissions reductions achieved by the CAM rule are not double-counted. We determined previously during the CAM rule development that the detection of a problem with an add-on air pollution control device that is monitored once per day could take up to 12 hours to detect. After the problem has been detected, it may take an additional 24 hours to conduct the repair, during which time the process may be emitting above the emissions limit. The entire excess emissions period could last up to 36 hours. By increasing the frequency of monitoring and conducting diligent repair, the time required to detect a

problem will decrease, and the time a unit operates in excess emission mode or malfunction will decrease.

Examples of the Emissions Reductions that Can Be Achieved. In a six-metropolitan statistical area (MSA) mini-study, we reviewed the PM<sub>2.5</sub> emissions data (filterable and some condensable) from the 1999 NEI version 3 for all emission points at stationary sources located in the MSAs. We applied the improved monitoring control measures to only those emission points in the MSA that are controlled with fabric filters, electrostatic precipitators, and scrubbers. This subset included a total of 689 emission points at 128 facilities.

Based on review of emission points with add-on air pollution control devices, we found that PM<sub>2.5</sub> emissions (filterable/some condensable) can be reduced from 0.25 percent up to 13 percent following the application of a requirement to conduct more frequent monitoring. Potential PM<sub>2.5</sub> emissions reductions ranged from 89 tons per year to 4,600 tons per year with increased monitoring frequency. We also found that PM<sub>2.5</sub> emissions (filterable/some condensable) can be reduced from 2.5 percent to 15 percent by requiring an improved monitoring technique such as a PM CEMS (and a corollary increased frequency). The potential PM<sub>2.5</sub> emissions reductions ranged from 810 to 5,300 tons per year. We analyzed the emissions reductions achievable by reducing the excess emission rate from the nominal 5 percent excess emissions to an excess emissions rate of 2.5 percent (half of the nominal excess emission rate), 0.46 percent (represents one week of excess emissions each year, 40 hours out of 8760), and 0 percent (no excess emissions). As mentioned previously, there may be some facilities with an excess emissions rate even greater than 5 percent; in these instances, the potential emissions reductions due to improved monitoring may be even greater. The emissions reduction calculation for application of an improved monitoring control measure included a certainty factor related to detecting excess emission periods and assurance of emissions levels. The certainty factor for PM CEMS was 1.0, the factor for BLD was 0.95, and the factor for parametric monitoring was 0.90. The certainty factor for visual emissions and COMS when used to monitor PM was also 0.90.

In another example of an improved monitoring technique, a BLD monitoring system was applied only to the subset of emission units in the six MSA area that are controlled with fabric filters. A total of 102 facilities were affected by

this option. In this scenario, the emission reduction (filterable PM<sub>2.5</sub> only) was determined to be 0.78 to 12 percent, or 280 to 4,100 tons per year.

Costs to conduct monitoring at an increased frequency included the cost to develop the more frequent monitoring approach and the incremental annual costs for recordkeeping, reporting, and certification related to the improved monitoring. Costs to implement an improved monitoring technique included the total annual cost for the new monitoring equipment, including the recordkeeping and reporting costs associated with the new monitoring. We anticipate that changes to monitoring would be incorporated into individual facility permits at permit renewal, to help minimize costs to air agencies and source owners/operators; costs related to incorporating the improved monitoring into permits on a quicker basis than regular permit renewal have not been assessed. The cost algorithms for the six-MSA study are delineated in the "Improved Monitoring" memorandum. The cost-effectiveness values include the emissions reductions for PM<sub>2.5</sub> filterable and some condensable. When reduction of co-pollutants are included in the cost-effectiveness analysis, the cost-effectiveness values are even lower. States can compare the cost effectiveness for improved monitoring to the cost effectiveness of other PM<sub>2.5</sub> control measures when selecting the mix of measures for their implementation plans.

The methods for estimating emission reductions and cost effectiveness ranges for the six-city study discussed in this section are based on the best technical information we had available. We recognize that commenters may have suggestions for ways to improve these estimates. Thus, to inform our guidance development, we solicit your comments on a number of issues. We solicit your comments on these control measures for increased frequency of monitoring and improved monitoring technique. We also request your comments on the feasibility of co-pollutant control due to improved monitoring measures. We also solicit submission of developed examples of improved monitoring, including a description of the measure, monitoring data, etc., if available. Finally, we encourage submission of methodologies—complete with equations and explanations—for estimating emissions reductions due to improved monitoring other than those referenced here.

<sup>117</sup> In the six metropolitan statistical areas reviewed for this study, 100 percent rule effectiveness and 100 percent rule penetration was shown in the 1999 NEI version 3 for all facilities.

*R. What guidance should be provided that is specific to Tribes?*

This section summarizes guidance for Tribes offered in various parts of this proposal. The 1998 Tribal Authority Rule (TAR) (40 CFR part 49), which implements section 301(d) of the CAA, gives Tribes the option of developing tribal implementation plans (TIPs). Specifically, the TAR provides for the Tribes to be treated in the same manner as a State in implementing sections of the CAA. However, Tribes are not required to develop implementation plans. The EPA determined in the TAR that it was inappropriate to treat Tribes in a manner similar to a State with regard to specific plan submittal and implementation deadlines for NAAQS-related requirements, including, but not limited to, such deadlines in CAA sections 110(a)(1), 172(a)(2), 182, 187, and 191.<sup>118</sup>

If a Tribe elects to do a TIP, we will work with the Tribe to develop an appropriate schedule which meets the needs of the Tribe, and which does not interfere with the attainment of the NAAQS in other jurisdictions. The Tribe developing a TIP can work with the EPA Regional Office on the appropriateness of addressing RFP and other substantive SIP requirements that may or may not be appropriate for the Tribe's situation.

The TAR indicates that EPA is ultimately responsible for implementing CAA programs in Indian country, as necessary and appropriate, if Tribes choose not to implement those provisions. For example, an unhealthy air quality situation in Indian country may require EPA to develop a FIP to reduce emissions from sources on the reservation. In such a situation, EPA, in consultation with the Tribe and in consideration of their needs, would work to ensure that the NAAQS are met as expeditiously as practicable. Likewise, if we determine that sources in Indian country could interfere with a larger nonattainment area meeting the NAAQS by its attainment date, we would develop a FIP for those sources in consultation with the Tribe, as necessary or appropriate.

<sup>118</sup> See 40 CFR 49.4(a). In addition, EPA determined it was not appropriate to treat tribes similarly to states with respect to provisions of the CAA requiring as a condition of program approval the demonstration of criminal enforcement authority or providing for the delegation of such criminal enforcement authority. See 40 CFR 49.4(g). To the extent a tribe is precluded from asserting criminal enforcement authority, the federal government will exercise primary criminal enforcement responsibility. See 40 CFR 49.8. In such circumstances, tribes seeking approval for CAA programs provide potential investigative leads to an appropriate federal enforcement agency.

The TAR also provides flexibility for the Tribe in the preparation of a TIP to address the NAAQS. If a Tribe elects to develop a TIP, the TAR offers flexibility to Tribes to identify and implement—on a Tribe-by-Tribe, case-by-case basis—only those CAA programs or program elements needed to address their specific air quality problems. In the proposed Tribal rule, we described this flexible implementation approach as a “modular approach.” Each Tribe may evaluate the particular activities, including potential sources of air pollution within the exterior boundaries of its reservation (or within non-reservation areas for which it has demonstrated jurisdiction), which cause or contribute to its air pollution problem. A Tribe may adopt measures for controlling those sources of PM<sub>2.5</sub>-related emissions, as long as the elements of the TIP are “reasonably severable” from the package of elements that can be included in a whole TIP. A TIP must include regulations designed to solve specific air quality problems for which the Tribe is seeking EPA approval, as well as a demonstration that the Tribal air agency has the authority from the Tribal government to develop and run their program, the capability to enforce their rules, and the resources to implement the program they adopt. In addition, the Tribe must receive an “eligibility determination” from EPA to be treated in the same manner as a State and to receive authorization from EPA to run a CAA program.

EPA would review and approve, where appropriate, these partial TIPs as one step of an overall air quality plan to attain the NAAQS. A Tribe may step in later to add other elements to the plan, or EPA may step in to fill gaps in the air quality plan as necessary or appropriate. In approving a TIP, we would evaluate whether the plan interferes with the overall air quality plan for an area when Tribal lands are part of a multi-jurisdictional area.

Because many of the nonattainment areas will include multiple jurisdictions, and in some cases both Tribal and State jurisdictions, it is important for the Tribes and the States to work together to coordinate their planning efforts. States need to incorporate Tribal emissions in their base emission inventories if Indian country is part of an attainment or nonattainment area. Tribes and States need to coordinate their planning activities as appropriate to ensure that neither is adversely affecting attainment of the NAAQS in the area as a whole.

*S. Are there any additional requirements related to enforcement and compliance?*

In general, for a SIP regulation to be enforceable, it must clearly spell out which sources or source types are subject to its requirements and what its requirements (e.g., emission limits, work practices, etc.) are. The regulation also needs to specify the time frames within which these requirements must be met, and must definitively state recordkeeping and monitoring requirements appropriate to the type of sources being regulated. The recordkeeping and monitoring requirements must be sufficient to allow determinations on a continuing basis whether sources are complying. An enforceable regulation must also contain test procedures in order to determine whether sources are in compliance.

Under the Title V regulations, major sources have an obligation to include in their Title V permit applications all emissions for which the source is major and all emissions of regulated air pollutants. The definition of regulated air pollutant in 40 CFR 70.2 includes any pollutant for which a NAAQS has been promulgated, which would include both PM<sub>10</sub> and PM<sub>2.5</sub>. To date, some permitted entities have been using PM<sub>10</sub> emissions as a surrogate for PM<sub>2.5</sub> emissions. Upon promulgation of this rule, EPA will no longer accept the use of PM<sub>10</sub> as a surrogate for PM<sub>2.5</sub>. Thus, sources will be required to include their PM<sub>2.5</sub> emissions in their Title V permit applications, in any corrections or supplements to these applications, and in applications submitted upon modification and renewal.<sup>119</sup> Sources must continue to identify their PM<sub>10</sub> emissions in their applications as described above because the original PM<sub>10</sub> NAAQS remains in effect.

*T. What requirements should apply to emergency episodes?*

Currently, subpart H of 40 CFR part 51 specifies requirements for SIPs to address emergency air pollution episodes and for preventing air pollutant levels from reaching levels determined to cause significant harm to human health. We anticipate proposing a separate rulemaking in the future to update portions of that rule to address the 8-hour ozone and PM<sub>2.5</sub> NAAQS.

<sup>119</sup> See 40 CFR 70.5(c)(3)(i), 70.5(b), and 70.7(a)(1)(i); 40 CFR 71.5(c)(3)(i), 71.5(b), and 71.7(a)(1)(i).

*U. What ambient monitoring requirements will apply under the PM<sub>2.5</sub> NAAQS?*

States are required to monitor PM<sub>2.5</sub> mass concentrations using Federal Reference Method devices to determine compliance with the NAAQS.<sup>120</sup> Currently, there are more than 1200 FRM monitors located across the country. States will need to maintain monitors in designated nonattainment areas in order to track progress toward attainment and ultimately determine whether the area has attained the PM<sub>2.5</sub> standards.

In addition to the FRM network, EPA and the States have also deployed more than 250 speciation monitoring sites around the country to sample for chemical composition of PM<sub>2.5</sub>. The data provided from these speciation monitors are invaluable in identifying contributing source categories and developing control strategies to reach attainment. Source apportionment and other receptor modeling techniques rely on the detailed data on species, ions, and other compounds obtained from chemical analysis. Analyses of rural versus urban sites to identify which PM<sub>2.5</sub> components comprise the "urban excess" (urban minus rural levels) portion of PM<sub>2.5</sub> mass also rely on data from speciation monitors. The EPA encourages states to expand their data analysis efforts using the wealth of information provided from the speciation monitoring network.

#### IV. Statutory and Executive Order Reviews

##### A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866, [58 FR 51735 (October 4, 1993)] the Agency must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees,

or loan programs or the rights and obligations of recipients thereof; or  
(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Under the terms of Executive Order 12866, it has been determined that this rule is a "significant regulatory action." As such, this action was submitted to OMB for EO 12866 review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

##### B. Paperwork Reduction Act

The information collection requirements in this rule will be submitted for approval to OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* The information collection requirements are not enforceable until OMB approves them other than to the extent required by statute.

This rule provides the framework for the States to develop SIPs to achieve a new or revised NAAQS. This framework reflects the requirements prescribed in CAA sections 110 and part D, subpart 1 of title I. In that sense, the present final rule does not establish any new information collection burden on States. Had this rule not been developed, States would still have the legal obligation under law to submit nonattainment area SIPs under part D of title I of the CAA within specified periods after their nonattainment designation for the PM<sub>2.5</sub> standards, and the SIPs would have to meet the requirements of part D.

A SIP contains rules and other requirements designed to achieve the NAAQS by the deadlines established under the CAA, and also contains a demonstration that the State's requirements will in fact result in attainment. The SIP must meet the CAA requirements in subpart 1 to adopt RACM, RACT, and provide for RFP toward attainment for the period prior to the area's attainment date. After a State submits a SIP, the CAA requires EPA to approve or disapprove the SIP. If EPA approves the SIP, the rules in the SIP become federally enforceable. If EPA disapproves the SIP (or if EPA finds that a State fails to submit a SIP), the CAA requires EPA to impose sanctions (2:1 offsets for major new or modified sources and restrictions on Federal highway funding) within specified timeframes; additionally, EPA must prepare and publish a SIP within 2 years after a disapproval or finding of failure to submit. The SIP must be publicly available. States must maintain confidentiality of confidential business information, however, if used to support SIP analyses. The SIP is a one-time

submission, although the CAA requires States to revise their SIPs if EPA requests a revision upon a finding that the SIP is inadequate to attain or maintain the NAAQS. The State may revise its SIP voluntarily as needed, but in doing so must demonstrate that any revision will not interfere with attainment or RFP or any other applicable requirement under the CAA (see section 110(l)).

This rule does not establish requirements that directly affect the general public and the public and private sectors, but, rather, interprets the statutory requirements that apply to States in preparing their SIPs. The SIPs themselves will likely establish requirements that directly affect the general public, and the public and private sectors.

The EPA has not yet projected cost and hour burden for the statutory SIP development obligation but has started that effort and will shortly prepare an Information Collection Request (ICR) request. However, EPA did estimate administrative costs at the time of promulgation of the PM<sub>2.5</sub> standards in 1997. See Chapter 10 of U.S. EPA 1997, Regulatory Impact Analyses for the Particulate Matter and Ozone National Ambient Air Quality Standards, Innovative Strategies and Economics Group, Office of Air Quality Planning and Standards, Research Triangle Park, N.C., July 16, 1997. Assessments of some of the administrative cost categories identified as a part of the SIP for the PM<sub>2.5</sub> standards have already been conducted as a result of other provisions of the CAA and associated ICRs (e.g., emission inventory preparation, air quality monitoring program, conformity assessments, NSR, I/M program).

The burden estimates in the ICR for this rule are incremental to what is required under other provisions of the CAA. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

<sup>120</sup> The PM<sub>2.5</sub> monitoring regulations are located at 40 CFR Part 58.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9. When this ICR is approved by OMB, the Agency will publish a technical amendment to 40 CFR part 9 in the **Federal Register** to display the OMB control number for the approved information collection requirements contained in this final rule. However, the failure to have an approved ICR for this rule does not affect the statutory obligation for the States to submit SIPs as required under part D of the CAA.

The information collection requirements associated with NSR permitting for ozone are covered by EPA's request to renew the approval of the ICR for the NSR program, ICR 1230.17, which was approved by OMB on January 25, 2005. The information collection requirements associated with NSR permitting were previously covered by ICR 1230.10 and 1230.11. The OMB previously approved the information collection requirements contained in the existing NSR regulations at 40 CFR parts 51 and 52 under the provisions of the Paperwork Reduction Act, and assigned OMB control number 2060-0003. A copy of the approved ICR may be obtained from Susan Auby, Collection Strategies Division; U.S. Environmental Protection Agency (2822T); 1200 Pennsylvania Ave., NW., Washington, DC 20460 or by calling (202) 566-1672.

### C. Regulatory Flexibility Act

The Regulatory Flexibility Act generally requires an Agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedures Act or any other statute unless the Agency certifies the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's proposed rule on small entities, small entity is defined as: (1) A small business that is a small industrial entity as defined in the U.S. Small Business Administration (SBA) size standards. (See 13 CFR part 121); (2) a governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently

owned and operated and is not dominant in its field.

After considering the economic impacts of today's proposed rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. The proposed rule governing SIPs will not directly impose any requirements on small entities. Rather, this rule interprets the obligations established in the CAA for States to submit implementation plans in order to attain the PM<sub>2.5</sub> NAAQS.

Additionally, with respect to NSR, this proposed rule does not itself create the obligation to obtain an NSR permit for new major stationary sources and modifications resulting in emissions of PM<sub>2.5</sub> and its precursors. Rather, the preexisting rules establish this obligation, and this proposed rule clarifies how that obligation will be implemented.

We believe that the existing Regulatory Flexibility Screening Analysis (RFASA) further supports the conclusion that the NSR proposal will not have a significant economic impact on a substantial number of small entities. The RFASA, developed as part of a 1994 draft Regulatory Impact Analysis (RIA) and incorporated into the September 1995 ICR renewal analysis, showed that the changes to the NSR program due to the 1990 CAA Amendments would not have an adverse impact on small entities. This analysis encompassed the entire universe of applicable major sources that were likely to also be small businesses (approximately 50 "small business" major sources). Because the administrative burden of the NSR program is the primary source of the NSR program's regulatory costs, the analysis estimated a negligible "cost to sales" (regulatory cost divided by the business category mean revenue) ratio for this source group. Currently, there is no economic basis for a different conclusion. We do not believe the number of "small business" major sources will increase appreciably because all sources who are major for PM<sub>2.5</sub> or one of its precursors (SO<sub>2</sub>, NO<sub>x</sub>, or VOC) will already be major for PM<sub>10</sub> or such precursor. We continue to be interested in the potential impacts of the proposed rule on small entities and welcome comments on issues related to such impacts.

### D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local,

and Tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of \$100 million or more in any 1 year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

The EPA has determined that this rule does not contain a Federal mandate that may result in expenditures of \$100 million or more for State, local, and Tribal governments, in the aggregate, or the private sector in any 1 year. The estimated administrative burden hour and costs associated with implementing the PM<sub>2.5</sub> NAAQS were developed upon promulgation of the standard and presented in Chapter 10 of U.S. EPA 1997, Regulatory Impact Analyses for the Particulate Matter and Ozone National Ambient Air Quality Standards, Innovative Strategies and Economics Group, Office of Air Quality Planning and Standards, Research Triangle Park, N.C., July 16, 1997. The estimated costs presented there for States in 1990 dollars totaled \$0.9 million. The corresponding estimate in 1997 dollars is \$1.1 million. Thus, today's rule is not subject to the requirements of section 202 and 205 of the UMRA.

The CAA imposes the obligation for States to submit SIPs to implement the PM<sub>2.5</sub> NAAQS. In this rule, EPA is merely providing an interpretation of those requirements. However, even if this rule did establish an independent requirement for States to submit SIPs, it is questionable whether a requirement to submit a SIP revision would constitute a Federal mandate in any case. The obligation for a State to submit a SIP that arises out of section 110 and section 172 (part D) of the CAA is not legally enforceable by a court of law, and at most is a condition for continued receipt of highway funds. Therefore, it is possible to view an action requiring such a submittal as not creating any enforceable duty within the meaning of section 421(5)(9a)(I) of UMRA (2 U.S.C. 658(a)(I)). Even if it did, the duty could be viewed as falling within the exception for a condition of Federal assistance under section 421(5)(a)(i)(I) of UMRA (2 U.S.C. 658(5)(a)(i)(I)).

In the proposal, EPA has determined that this proposed rule contains no regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments. Nonetheless, EPA carried out consultations with governmental entities affected by this rule.

#### *E. Executive Order 13132: Federalism*

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications." "Policies that have federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. As described in section D, above (on UMRA), EPA previously determined the costs to States to implement the PM<sub>2.5</sub> NAAQS to be approximately \$0.9 million in 1990 dollars. The corresponding estimate in 1997 dollars is \$1.1 million. While this proposed rule considers options not addressed at the time the NAAQS were promulgated, the costs for

implementation under these options would rise only marginally. This rule clarifies the statutory obligations of States in implementing the PM<sub>2.5</sub> NAAQS. Finally, the CAA establishes the scheme whereby States take the lead in developing plans to meet the NAAQS. This proposed rule would not modify the relationship of the States and EPA for purposes of developing programs to implement the NAAQS. Thus, Executive Order 13132 does not apply to this proposed rule.

Although section 6 of Executive Order 13132 does not apply to this rule, EPA actively engaged the States in the development of this proposed rule. The EPA held a number of calls with representatives of State and local air pollution control agencies.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

#### *F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments*

Executive Order 13175, entitled "Consultation and Coordination with Indian Tribal Governments" (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure "meaningful and timely input by Tribal officials in the development of regulatory policies that have Tribal implications." This proposed rule does not have "Tribal implications" as defined in Executive Order 13175. This rule concerns the requirements for state and tribal implementation plans for attaining the PM<sub>2.5</sub> air quality standards. The CAA provides for States to develop plans to regulate emissions of air pollutants within their jurisdictions. The Tribal Air Rule (TAR) under the CAA gives Tribes the opportunity to develop and implement CAA programs such as programs to attain and maintain the PM<sub>2.5</sub> NAAQS, but it leaves to the discretion of the Tribe the decision of whether to develop these programs and which programs, or appropriate elements of a program, they will adopt.

This proposed rule does not have Tribal implications as defined by Executive Order 13175. It does not have a substantial direct effect on one or more Indian Tribes, since no Tribe has implemented a CAA program to attain the PM<sub>2.5</sub> NAAQS at this time. EPA notes that even if a Tribe were implementing such a plan at this time, while the rule might have Tribal implications with respect to that Tribe, it would not impose substantial direct

costs upon it, nor would it preempt Tribal law.

Furthermore, this rule does not affect the relationship or distribution of power and responsibilities between the Federal government and Indian Tribes. The CAA and the TAR establish the relationship of the Federal government and Tribes in developing plans to attain the NAAQS, and this rule does nothing to modify that relationship. As this rule does not have Tribal implications, Executive Order 13175 does not apply.

Although Executive Order 13175 does not apply to this rule, EPA did reach out to Tribal leaders and environmental staff regarding this proposal. The EPA supports a national "Tribal Designations and Implementation Work Group" which provides an open forum for all Tribes to voice concerns to EPA about the designations and implementation process for the NAAQS, including the PM<sub>2.5</sub> NAAQS. In conference calls EPA briefed Work Group participants and Tribal environmental professionals gave input as the rule was under development. Furthermore, EPA is sending individualized letters to all federally recognized Tribes about this proposal to give Tribal leaders the opportunity for consultation. EPA specifically solicits additional comment on this proposed rule from tribal officials.

#### *G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks*

Executive Order 13045: "Protection of Children From Environmental Health and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that (1) is determined to be "economically significant" as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

The proposed rule is not subject to Executive Order 13045. Nonetheless, we have evaluated the environmental health or safety effects of the PM<sub>2.5</sub> NAAQS on children. The results of this evaluation are contained in the 1997 **Federal Register** notice establishing the PM<sub>2.5</sub> standards.<sup>121</sup> In a number of

<sup>121</sup> See 62 FR 38652-38760, National Ambient Air Quality Standards for Particulate Matter, Final Rule; also 40 CFR Part 50.

locations in that notice, children are identified as one of the principle sub-populations that are particularly sensitive to exposure to fine particle pollution. Today's proposed rule provides the framework by which States will require sources to reduce pollutant emissions, thereby improving air quality and reducing the exposure of children and others to unhealthy levels of fine particle pollution.

*H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use*

This proposed rule is not a "significant energy action" as defined in Executive Order 13211, "Actions That Significantly Affect Energy Supply, Distribution, or Use," (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

*I. National Technology Transfer Advancement Act*

Section 12(d) of the National Technology Transfer Advancement Act of 1995 (NTTAA), Public Law 104-113, section 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards (VCS) in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by VCS bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable VCS.

This proposed rulemaking does not involve technical standards. Therefore, EPA is not considering the use of any VCS.

The EPA will encourage the States and Tribes to consider the use of such standards, where appropriate, in the development of the implementation plans.

*J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*

Executive Order 12898 requires that each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionate high and adverse human health or environmental effects of its programs, policies, and activities on minorities and low-income populations.

The EPA believes that this proposed rule should not raise any environmental

justice issues. The health and environmental risks associated with ozone were considered in the establishment of the PM<sub>2.5</sub> NAAQS. The level is designed to be protective with an adequate margin of safety. The proposed rule provides a framework for improving environmental quality and reducing health risks for areas that may be designated nonattainment.

Dated: September 8, 2005.

**Stephen L. Johnson,**  
Administrator.

For the reasons stated in the preamble, Title 40, Chapter I of the Code of Federal Regulations is proposed to be amended as follows:

**PART 51—REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF IMPLEMENTATION PLANS**

1. The authority citation for part 51 continues to read as follows:

**Authority:** 23 U.S.C. 101; 42 U.S.C. 7401-7671q.

**Subpart I—Review of New Sources and Modifications**

2. Section 51.165 is amended:
- By revising paragraphs (a)(1)(x), (a)(1)(xxxvii)(B), (a)(1)(xxxvii)(C);
  - By adding paragraphs (a)(1)(xxxvii)(D) and (a)(9); and
  - By adding and reserving paragraph (a)(8) to read as follows:

**§ 51.165 Permit requirements.**

- (a) \* \* \*  
(1) \* \* \*  
(x) Significant means in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates:

**Pollutant Emission Rate**

Carbon monoxide: 100 tons per year (tpy).

Nitrogen oxides: 40 tpy.

Sulfur dioxide: 40 tpy.

Ozone: 40 tpy of volatile organic compounds.

Lead: 0.6 tpy.

PM<sub>10</sub>: 15 tpy.

PM<sub>2.5</sub>: 10 tpy of PM<sub>2.5</sub> emissions; 40 tpy of sulfur dioxide emissions; 40 tpy of nitrogen oxide emissions when identified as a PM<sub>2.5</sub> precursor under paragraph (a)(1)(xxxvii) of this section.

\* \* \* \* \*

(xxxvii) \* \* \*

(B) Any pollutant for which a national ambient air quality standard has been promulgated;

(C) Any pollutant that is a constituent or precursor of a general pollutant listed

under paragraphs (a)(1)(xxxvii)(A) or (B) of this section, provided that a constituent or precursor pollutant may only be regulated under NSR as part of regulation of the general pollutant. Precursors identified by the Administrator for purposes of NSR are the following:

(1) Volatile organic compounds and nitrogen oxides are precursors to ozone in all ozone nonattainment areas.

(2) Sulfur dioxide is a precursor to PM<sub>2.5</sub> in all PM<sub>2.5</sub> nonattainment areas.

(3) Nitrogen oxides are presumed to be precursors to PM<sub>2.5</sub> in all PM<sub>2.5</sub> nonattainment areas, unless the State demonstrates to the Administrator's satisfaction that emissions of nitrogen oxides from stationary sources in a specific area are not a significant contributor to that area's ambient PM<sub>2.5</sub> concentrations and the area is not in a State identified by the Administrator as a source of a PM<sub>2.5</sub> interstate transport problem.

(4) Volatile organic compounds and ammonia are presumed not to be precursors to PM<sub>2.5</sub> in any PM<sub>2.5</sub> nonattainment area, unless the State demonstrates to the Administrator's satisfaction that emissions of volatile organic compounds or ammonia from stationary sources in a specific area are a significant contributor to that area's ambient PM<sub>2.5</sub> concentrations; or

(D) Particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) includes gaseous emissions from a source or activity which condense to form particulate matter at ambient temperatures.

\* \* \* \* \*

(8) [Reserved.]

(9) (i) The plan shall require that in meeting the emissions offset requirements of paragraph (a)(3) of this section, the ratio of total actual emissions reductions to the emissions increase shall be at least 1:1 unless an alternative ratio is provided for the applicable nonattainment area in paragraph (a)(9)(ii) through (a)(9)(iv) of this section.

(ii) The plan shall require that in meeting the emissions offset requirements of paragraph (a)(3) of this section for ozone nonattainment areas that are subject to subpart 2, part D, title I of the Act, the ratio of total actual emissions reductions of VOC to the emissions increase of VOC shall be as follows:

(A) In any marginal nonattainment area for ozone—at least 1.1:1;

(B) In any moderate nonattainment area for ozone—at least 1.15:1;

(C) In any serious nonattainment area for ozone—at least 1.2:1;

(D) In any severe nonattainment area for ozone—at least 1.3:1 (except that the

ratio may be at least 1.2:1 if the approved plan also requires all existing major sources in such nonattainment area to use BACT for the control of VOC); and

(E) In any extreme nonattainment area for ozone—at least 1.5:1 (except that the ratio may be at least 1.2:1 if the approved plan also requires all existing major sources in such nonattainment area to use BACT for the control of VOC); and

(iii) Notwithstanding the requirements of paragraph (a)(9)(ii) of this section for meeting the requirements of paragraph (a)(3) of this section, the ratio of total actual emissions reductions of VOC to the emissions increase of VOC shall be at least 1.15:1 for all areas within an ozone transport region that is subject to subpart 2, part D, title I of the Act, except for serious, severe, and extreme ozone nonattainment areas that are subject to subpart 2, part D, title I of the Act.

(iv) The plan shall require that in meeting the emissions offset requirements of paragraph (a)(3) of this section for ozone nonattainment areas that are subject to subpart 1, part D, title I of the Act (but are not subject to subpart 2, part D, title I of the Act, including 8-hour ozone nonattainment areas subject to 40 CFR 51.902(b)), the ratio of total actual emissions reductions of VOC to the emissions increase of VOC shall be at least 1:1.

3. Section 51.166 is amended:

- a. By adding paragraph (a)(6)(iv).
b. By revising paragraphs (b)(23)(i), (b)(49)(i), (b)(49)(iii), (i)(5)(ii), and (i)(5)(iii);
c. By adding and reserving paragraph (b)(49)(v); and
d. By adding paragraphs (b)(49)(vi) to read as follows:

§ 51.166 Prevention of significant deterioration of air quality.

(a) \* \* \*
(6) \* \* \*
(iv) When an implementation plan must be amended to address the prevention of significant deterioration of air quality for the PM2.5 national ambient air quality standards, the PM10 implementation plan provisions approved pursuant to this section may be used to implement a PM2.5 program until such amendments are approved, provided that: Particulate matter emissions shall include gaseous emissions from a source or activity which condense to form particulate matter at ambient temperatures for purposes of determining applicability of prevention of significant deterioration

requirements; and the air quality analysis required under paragraph (m) of this section shall be conducted with respect to the PM2.5 standards.

(b) \* \* \*
(23) (i) Significant means, in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates:

Pollutant and Emissions Rate

- Carbon monoxide: 100 tons per year (tpy).
Nitrogen oxides: 40 tpy.
Sulfur dioxide: 40 tpy.
Particulate matter: 25 tpy of particulate matter emissions. 15 tpy of PM10 emissions.
PM2.5: 10 tpy of PM2.5 emissions; 40 tpy of sulfur dioxide emissions; 40 tpy of nitrogen oxide emissions when identified as a PM2.5 precursor under paragraph (b)(49).
Ozone: 40 tpy of volatile organic compounds.

- Lead: 0.6 tpy.
Fluorides: 3 tpy.
Sulfuric acid mist: 7 tpy.
Hydrogen sulfide (H2 S): 10 tpy.
Total reduced sulfur (including H2 S): 10 tpy.
Reduced sulfur compounds (including H2 S): 10 tpy.
Municipal waste combustor organics (measured as total tetra-through octachlorinated dibenzo-p-dioxins and dibenzofurans): 3.2 x 10-6 megagrams per year (3.5 x 10-6 tons per year).

- Municipal waste combustor metals (measured as articulate matter): 14 megagrams per year (15 tons per year)
Municipal waste combustor acid gases (measured as sulfur dioxide and hydrogen chloride): 36 megagrams per year (40 tons per year)
Municipal solid waste landfill emissions (measured as nonmethane organic compounds): 45 megagrams per year (50 tons per year).

(49) Regulated NSR pollutant, for purposes of this section, means the following:

(i) Any pollutant for which a national ambient air quality standard has been promulgated and any constituents or precursors to such pollutants. Precursors identified by the Administrator for purposes of NSR are the following:

- (A) Volatile organic compounds and nitrogen oxides are precursors to ozone in all attainment and unclassifiable areas.
(B) Sulfur dioxide is a precursor to PM2.5 in all attainment and unclassifiable areas.

(C) Nitrogen oxides are presumed precursors to PM2.5 in all attainment and unclassifiable areas, unless the State demonstrates to the Administrator's satisfaction that emissions of nitrogen oxides from stationary sources in a specific area are not a significant contributor to that area's ambient PM2.5 concentrations and the area is not in a State identified by the Administrator as a source of a PM2.5 interstate transport problem.

(D) Volatile organic compounds are presumed not to be precursors to PM2.5 in any attainment or unclassifiable area, unless the State demonstrates to the Administrator's satisfaction that emissions of volatile organic compounds from stationary sources in a specific area are a significant contributor to that area's ambient PM2.5 concentrations.

(iii) Any Class I or II substance subject to a standard promulgated under or established by title VI of the Act;

(v) [Reserved.];
(vi) Particulate matter (PM2.5 and PM10) emissions include gaseous emissions from a source or activity which condense to form particulate matter at ambient temperatures.

(i) \* \* \*
(5) \* \* \*
(ii) The concentrations of the pollutant in the area that the source or modification would affect are less than the concentrations listed in paragraph (i)(5)(i) of this section; or
(iii) The pollutant is not listed in paragraph (i)(5)(i) of this section.

5. A new Subpart Y is added to read as follows:

Subpart Y—Provisions for Implementation of PM2.5 National Ambient Air Quality Standards

- Sec.
51.1000 Definitions.
51.1001 Applicability of part 51.
51.1002 Submittal of State implementation plan.
51.1003 Classifications.
51.1004 Attainment dates.
51.1005 One-year extensions of the attainment date.
51.1006 Redesignation to nonattainment following initial designations for the PM2.5 NAAQS.
51.1007 Attainment demonstration and modeling requirements.
51.1008 Emission inventory requirements for the PM2.5 NAAQS.
51.1009 Reasonable further progress (RFP) requirements.
51.1010 Requirements for reasonably available control technology (RACT) and



reasonably available control measures (RACM).

### Subpart Y—Provisions for Implementation of PM<sub>2.5</sub> National Ambient Air Quality Standards

#### § 51.1000 Definitions.

The following definitions apply for purposes of this subpart. Any term not defined herein shall have the meaning as defined in 40 CFR 51.100.

(a) Act means the Clean Air Act as codified at 42 U.S.C. 7401–7671q. (2003).

(b) Attainment year means the final year of the three consecutive years evaluated to determine attainment with the PM<sub>2.5</sub> NAAQS.

(c) Benchmark RFP plan means the reasonable further progress plan that requires generally linear emission reductions from the 2002 baseline emissions year through the emissions year preceding the RFP milestone.

(d) Date of designation means the effective date of the PM<sub>2.5</sub> area designation as promulgated by the Administrator.

(e) Direct PM<sub>2.5</sub> emissions means air pollutant emissions of direct fine particulate matter, including organic carbon, elemental carbon, direct sulfate, direct nitrate, and miscellaneous inorganic material (*i.e.* crustal material).

(f) Existing control measure means any federally enforceable national, State, or local control measure that has been approved in the SIP and that results in reductions in emissions of PM<sub>2.5</sub> and its precursors in a nonattainment area.

(g) PM<sub>2.5</sub> NAAQS means the particulate matter national ambient air quality standards (annual and 24-hour) codified at 40 CFR 50.7.

(h) PM<sub>2.5</sub> design value for a nonattainment area is the highest of the three-year average concentrations calculated for the monitors in the area, in accordance with 40 CFR part 50, appendix N.

(i) PM<sub>2.5</sub> direct emissions means solid particles emitted directly from an emissions source or activity, or gaseous emissions or liquid droplets from a source or activity which condense to form particulate matter at ambient temperatures. PM<sub>2.5</sub> direct emissions include elemental carbon, directly emitted organic carbon, and inorganic particles (including but not limited to crustal material, metals, and sea salt).

(j) PM<sub>2.5</sub> nonattainment plan precursor means those PM<sub>2.5</sub> precursors emitted by sources in the State which the State must evaluate for emission reduction measures.

(k) PM<sub>2.5</sub> precursor means those regulated air pollutants other than PM<sub>2.5</sub>

direct emissions that contribute to the formation of PM<sub>2.5</sub>. PM<sub>2.5</sub> precursors include SO<sub>2</sub>, NO<sub>x</sub>, volatile organic compounds, and ammonia.

(l) Reasonable further progress (RFP) means the incremental emissions reductions toward attainment required under section 172(c)(2) and section 171(1).

(m) Subpart 1 means subpart 1 of part D of title I of the Act.

#### § 51.1001 Applicability of Part 51.

The provisions in subparts A-X of part 51 apply to areas for purposes of the PM<sub>2.5</sub> NAAQS to the extent they are not inconsistent with the provisions of this subpart.

#### § 51.1002 Submittal of State Implementation Plan.

(a) For any area designated by EPA as nonattainment for the PM<sub>2.5</sub> NAAQS, the State shall submit a State implementation plan satisfying the requirements of section 172 of the Act and this subpart Y of 40 CFR part 51 to EPA no later than 3 years from the effective date of the designation.

(b) The State must submit a plan consistent with the requirements of section 110(a)(2) of the Act unless the State already has fulfilled this obligation for the purposes of implementing the PM<sub>2.5</sub> NAAQS.

(c) Precursors of fine particles. The state implementation plan must identify and evaluate sources of PM<sub>2.5</sub> direct emissions and PM<sub>2.5</sub> nonattainment plan precursors in accordance with §§ 51.1009 and 51.1010 of this subpart.

(1) The State must address sulfur dioxide as a PM<sub>2.5</sub> nonattainment plan precursor and evaluate SO<sub>2</sub> emissions sources for control measures.

(2) The State must address NO<sub>x</sub> as a PM<sub>2.5</sub> nonattainment plan precursor and evaluate sources of NO<sub>x</sub> emissions sources for control measures, unless the State and EPA provide an appropriate technical demonstration for a specific area showing that NO<sub>x</sub> emissions do not significantly contribute to the PM<sub>2.5</sub> nonattainment problem in the area or to other downwind air quality concerns.

(3) The State is not required to address VOC as a PM<sub>2.5</sub> nonattainment plan precursor and evaluate sources of VOC emissions for control measures in that area, unless:

(i) The State provides an appropriate technical demonstration for a specific area showing that VOC emissions significantly contribute to the PM<sub>2.5</sub> nonattainment problem in the area or to other downwind air quality concerns and such demonstration is approved by EPA, or

(ii) EPA provides such a technical demonstration.

(4) The State is not required to address ammonia as a PM<sub>2.5</sub> nonattainment plan precursor and evaluate sources of ammonia emissions for control measures in that area, unless:

(i) the State provides an appropriate technical demonstration for a specific area showing that ammonia emissions significantly contribute to the PM<sub>2.5</sub> nonattainment problem in the area or to other downwind air quality concerns and such demonstration is approved by EPA, or

(ii) EPA provides such a technical demonstration.

(5) Any technical demonstration referred to in paragraphs (c)(1) through (c)(4) of this section to modify the presumptive approach for any PM<sub>2.5</sub> precursor must be considered in future SIP development activities.

#### § 51.1003. Classifications.

An area designated as nonattainment for the PM<sub>2.5</sub> NAAQS will not receive a specific classification based on design value.

#### § 51.1004 Attainment dates.

(a) Consistent with section 172(a)(2)(A) of the Act, the attainment date for an area designated nonattainment for the PM<sub>2.5</sub> NAAQS shall be the date by which attainment can be achieved as expeditiously as practicable. The attainment date presumptively shall be 5 years or less from the date of designations. The Administrator may approve an attainment date extension pursuant to section 172(a)(2)(A).

(b) In the SIP submittal for each of its nonattainment areas, the State shall submit an attainment demonstration providing detailed information justifying its proposed attainment date. For each nonattainment area, the Administrator will approve an attainment date at the same time the Administrator approves the attainment demonstration for the area, consistent with the attainment date timing provision of section 172(a)(2)(A) and paragraph (a) of this section.

#### § 51.1005 One-year extensions of the attainment date.

(a) Pursuant to section 172(a)(2)(C)(ii) of the Act, a State with an area that fails to attain the PM<sub>2.5</sub> NAAQS by its attainment date may apply for an initial 1-year attainment date extension if the State has complied with all requirements and commitments pertaining to the area in the applicable implementation plan, and:

(1) For an area that violates the annual PM<sub>2.5</sub> NAAQS as of its attainment date, the annual average concentration for the

most recent year at each monitor is 15.0  $\mu\text{g}/\text{m}^3$  or less (calculated according to the data analysis requirements in 40 CFR part 50, appendix N).

(2) For an area that violates the 24-hour  $\text{PM}_{2.5}$  NAAQS as of its attainment date, the 98th percentile concentration for the most recent year at each monitor is 65  $\mu\text{g}/\text{m}^3$  or less (calculated according to the data analysis requirements in 40 CFR part 50, appendix N).

(b) An area that fails to attain the  $\text{PM}_{2.5}$  NAAQS after receiving a 1-year attainment date extension may apply for a second 1-year attainment date extension pursuant to section 172(a)(2)(C)(ii) if the State has complied with all requirements and commitments pertaining to the area in the applicable implementation plan, and:

(1) For an area that violates the annual  $\text{PM}_{2.5}$  NAAQS as of its attainment date, the annual average concentration at each monitor, averaged over both the original attainment year and the first extension year, is 15.0  $\mu\text{g}/\text{m}^3$  or less (calculated according to the data analysis requirements in 40 CFR part 50, appendix N).

(2) For an area that violates the 24-hour  $\text{PM}_{2.5}$  NAAQS as of its attainment date, the 98th percentile concentration at each monitor, averaged over both the original attainment year and the first extension year, is 65  $\mu\text{g}/\text{m}^3$  or less (calculated according to the data analysis requirements in 40 CFR part 50, appendix N).

**§ 51.1006 Redesignation to nonattainment following initial designations for the  $\text{PM}_{2.5}$  NAAQS.**

Any area that is initially designated "attainment/unclassifiable" for the  $\text{PM}_{2.5}$  NAAQS may be subsequently redesignated to nonattainment if ambient air quality data in future years indicate that such a redesignation is appropriate. For any area that is redesignated to nonattainment for the  $\text{PM}_{2.5}$  NAAQS, any absolute, fixed date that is applicable in connection with the requirements of this part is extended by a period of time equal to the length of time between the effective date of the initial designation for the  $\text{PM}_{2.5}$  NAAQS and the effective date of redesignation, except as otherwise provided in this subpart.

**§ 51.1007 Attainment demonstration and modeling requirements.**

(a) For any area designated as nonattainment for the  $\text{PM}_{2.5}$  NAAQS, the State must submit an attainment demonstration showing that the area will attain the annual and 24-hour standards as expeditiously as practicable. The demonstration must

include modeling results, inventory data, and emission reduction analyses on which the State has based its projected attainment date. Such modeling must be consistent with EPA guidance and must be appropriate for the area. The modeled strategies must be consistent with requirements in § 51.1009 for RFP and in § 51.1010 for RACT and RACM. The attainment demonstration and supporting air quality modeling must be consistent with Appendix W of this part and EPA's most recent modeling guidance in effect at the time the modeled attainment demonstration is performed.

(b) Required timeframe for obtaining emissions reductions. For each nonattainment area, the State implementation plan must provide for implementation of all control measures needed for attainment as expeditiously as practicable, but no later than the beginning of the year prior to the attainment date. Consistent with section 172(c)(1) of the Act, the plan must provide for implementation of all RACM and RACT as expeditiously as practicable. The plan also must include RFP milestones in accordance with § 51.1009, and control measures needed to meet these milestones, as necessary.

**§ 51.1008 Emission inventory requirements for the  $\text{PM}_{2.5}$  NAAQS.**

(a) For purposes of meeting the emission inventory requirements of section 172(c)(3) of the Act, the State shall:

(1) Submit to EPA statewide emission inventories for  $\text{PM}_{2.5}$  and its precursors under the Consolidated Emissions Reporting Rule (CERR), 40 CFR part 51, subpart A.

(2) Submit any additional emission inventory information needed to support an attainment demonstration and RFP plan ensuring expeditious attainment of the annual and 24-hour  $\text{PM}_{2.5}$  standards.

(b) A baseline emission inventory is required for the attainment demonstration required under § 51.1007 and for meeting RFP requirements under § 51.1009. As determined on the effective date of an area's nonattainment designation, the base year for this inventory shall be the most recent calendar year for which a complete inventory was required to be submitted to EPA pursuant to the Consolidated Emissions Reporting Rule in subpart A of this part. The baseline emission inventory for calendar year 2002 shall be used for attainment planning and RFP plans for areas initially designated nonattainment for the  $\text{PM}_{2.5}$  NAAQS.

**§ 51.1009 Reasonable further progress (RFP) requirements.**

(a) Consistent with section 172(c)(2) of the Act, State implementation plans for areas designated nonattainment for the  $\text{PM}_{2.5}$  NAAQS must demonstrate reasonable further progress as defined in section 171(1).

(b) Requirements for RFP plans.

(1) If the State submits an attainment plan for an area which proposes to attain the  $\text{PM}$  NAAQS within five years of the date of designation and such plan is approved by EPA, then compliance with the requirements of the attainment plan will be considered to also meet the requirements for achieving reasonable further progress for that area.

(2) For any area for which the State proposes an attainment date of more than five years from the date of designation (*i.e.* attainment date extension), the State must submit an RFP plan as part of its SIP submittal. The SIP submittal is due to EPA within three years of the date of designation.

(3) The RFP plan must require generally linear progress in direct  $\text{PM}_{2.5}$  and  $\text{PM}_{2.5}$  nonattainment plan precursor emission reductions from the 2002 base year through the year preceding the attainment date. For any area seeking an attainment date extension, the RFP plan must include RFP emission reduction milestones and projected air quality improvement to be achieved prior to January 1, 2010. Any area seeking an attainment date extension of three years or more must also include in its plan RFP emission reduction milestones and projected air quality improvement to be achieved prior to January 1, 2013. The State should develop these emission reduction milestones from attainment year modeling analyses and the projected direct  $\text{PM}_{2.5}$  and  $\text{PM}_{2.5}$  nonattainment plan precursor emission reduction levels presented in the analyses.

(4) In its RFP plan, the State must define the geographic area to be covered by the inventories for each pollutant addressed in the plan. For each pollutant, this area shall reflect the area for which the emissions of that pollutant best corresponds with concentrations of the associated ambient species in the nonattainment area, based on information developed during attainment planning. In no case shall the area be less than the nonattainment area. All emissions sources that the State intends to track for RFP purposes must be included in the 2002 baseline inventory.

(5) For any area seeking an attainment date extension beyond five years from designation, the benchmark RFP plan due with the area's attainment

demonstration shall include emission reduction milestones to be achieved by January 1, 2010 and January 1, 2013, if applicable. The following dates are defined for purposes of the benchmark RFP plan:

(i) The baseline year for the benchmark RFP plan is the 2002 emissions year.

(ii) The milestone date inventory is the emission inventory for the year prior to the January 1 milestone date.

(iii) The full implementation emission inventory is the emission inventory for the year preceding the attainment date.

(6) The plan shall address each emitted pollutant that is reduced or otherwise affected by the control strategy of the PM<sub>2.5</sub> attainment plan.

(7) For each pollutant addressed pursuant to paragraph (b)(6) of this section, an overall tonnage reduction shall be calculated by subtracting the full implementation emission inventory from the baseline year inventory.

(8) The "milestone date fraction" is the ratio of the number of years from the baseline year to the milestone inventory year divided by the number of years from the baseline year to the full implementation year.

(9) For each pollutant addressed pursuant to paragraph (b)(6) of this section, a benchmark tonnage emission reduction shall be calculated by multiplying the full strategy tonnage reduction pursuant to paragraph (b)(7) of this section times the milestone date fraction pursuant to paragraph (b)(8) of this section. The benchmark emission level for each pollutant as of the milestone date shall be determined by subtracting the benchmark tonnage emission reduction from the baseline year emission level. A benchmark RFP plan is defined as a plan that achieves benchmark emission levels for each pollutant to be addressed pursuant to paragraph (b)(6) of this section.

(10) The RFP plan due at the time of the attainment demonstration shall provide milestones that provide for emissions levels by January 1, 2010, to be either:

(i) At levels that are roughly equivalent to the benchmark emission levels defined in paragraph (b)(8) of this section for all applicable pollutants; or

(ii) At levels included in an alternative scenario that can be shown to provide generally equivalent air quality protection as the benchmark RFP plan.

(11) The equivalence of an alternative scenario to the corresponding benchmark plan shall be determined by comparing the expected air quality benefits of the two scenarios at the design value monitor location. This

comparison shall use the information developed for the attainment plan to assess the relationship between emissions reductions of the regulated pollutants and the ambient air quality improvement for the associated ambient species. The analysis of both scenarios may use the linear assumption that achievement of a given fraction of the emissions reductions of the attainment plan will achieve the same fraction of the associated air quality improvement that the attainment plan is demonstrated to achieve.

**§ 51.1010 Requirements for reasonably available control technology (RACT) and reasonably available control measures (RACM).**

(a) A PM<sub>2.5</sub> nonattainment area that provides an attainment demonstration proposing an attainment date no later than five years from the date of designation is required to conduct RACT determinations for major stationary sources and impose RACT controls only to the extent that such controls are necessary to meet RFP or attain the PM<sub>2.5</sub> standards as expeditiously as practicable.

(b) A PM<sub>2.5</sub> nonattainment area that provides an attainment demonstration proposing an attainment date of more than five years but no later than ten years from the date of designation must conduct a RACT determination for all stationary sources with the potential to emit 100 tons or more of any one pollutant associated with PM<sub>2.5</sub> (direct PM<sub>2.5</sub>, SO<sub>2</sub>, and NO<sub>x</sub>).

(c) In any source-specific RACT determination, the State must evaluate whether emission controls, process changes, or other emission reduction measures are technically and economically feasible in accordance with this rule and appropriate guidance. The State also must consider any additional information obtained through public comments when conducting RACT determinations for PM<sub>2.5</sub>. Any RACT emission reduction regulations required by the State must be included in the State's SIP submittal.

(d) For any source that installed controls due to a previous RACT determination for another NAAQS implementation program, the State may accept the previous RACT determination for the purposes of the PM<sub>2.5</sub> program, provided it submits a certification with appropriate supporting information that the previous RACT determination currently represents an appropriate level of control for the PM<sub>2.5</sub> program.

(e) For each PM<sub>2.5</sub> nonattainment area, the State shall submit with the attainment demonstration a SIP revision

demonstrating that it has adopted all reasonably available control measures necessary to demonstrate attainment as expeditiously as practicable and to meet any RFP requirements. In developing its attainment demonstration, in demonstrating attainment as expeditiously as practicable, and in determining whether a particular emission reduction measure or set of measures must be adopted as RACM under section 172(c)(1) of the Act, the State must consider the cumulative impact of implementing the available measures and whether such measures taken together would advance the attainment date by one year. In conducting a RACM analysis, the State should consider control technology information available in EPA and State guidance documents, in control technology clearinghouses, and in any comments provided by the public.

5. Appendix S to Part 51 is amended:

a. By revising paragraph II. A. 10.;

c. By adding paragraph II. A. 21.; and

b. By revising paragraph IV. G. to read as follows:

**Appendix S to Part 51—Emission Offset Interpretative Ruling**

\* \* \* \* \*

II. \* \* \*

A. \* \* \*

10. Significant means, in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates:

**Pollutant and Emissions Rate**

Carbon monoxide: 100 tons per year (tpy) .

Nitrogen oxides: 40 tpy.

Sulfur dioxide: 40 tpy.

Ozone: 40 tpy of volatile organic compounds.

Lead: 0.6 tpy.

Particulate matter: 25 tpy of particulate matter emissions.

PM<sub>10</sub>: 15 tpy.

PM<sub>2.5</sub>: 10 tpy of PM<sub>2.5</sub> emissions; 40 tpy of sulfur dioxide emissions; 40 tpy of nitrogen oxide emissions when identified as a PM<sub>2.5</sub> precursor under paragraph II. A. 21.

\* \* \* \* \*

21. Regulated NSR pollutant, for purposes of this section, means the following:

(i) Nitrogen oxides or any volatile organic compounds;

(ii) Any pollutant for which a national ambient air quality standard has been promulgated;

(iii) Any pollutant that is a constituent or precursor of a general pollutant listed under paragraphs II. A.

21. (i) or (ii) of this section, provided that a constituent or precursor pollutant may only be regulated under NSR as part of regulation of the general pollutant. Precursors identified by the Administrator for purposes of NSR are the following:

(a) Volatile organic compounds and nitrogen oxides are precursors to ozone in all ozone nonattainment areas.

(b) Sulfur dioxide is a precursor to PM<sub>2.5</sub> in all PM<sub>2.5</sub> nonattainment areas.

(c) Nitrogen oxides are presumed to be precursors to PM<sub>2.5</sub> in all PM<sub>2.5</sub> nonattainment areas, unless the State demonstrates to the Administrator's satisfaction that emissions of nitrogen oxides from stationary sources in a specific area are not a significant contributor to that area's ambient PM<sub>2.5</sub> concentrations and the area is not in a State identified by the Administrator as a source of a PM<sub>2.5</sub> interstate transport problem.

(d) Volatile organic compounds and ammonia are presumed not to be precursors to PM<sub>2.5</sub> in any PM<sub>2.5</sub> nonattainment area, unless the State demonstrates to the Administrator's satisfaction that emissions of volatile organic compounds or ammonia from stationary sources in a specific area are a significant contributor to that area's ambient PM<sub>2.5</sub> concentrations; or

(iv) Particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) includes gaseous emissions from a source or activity which condense to form particulate matter at ambient temperatures.

\* \* \* \* \*

IV. \* \* \*

G. Offset Ratios.

1. In meeting the emissions offset requirements of paragraph IV. A., Condition 3 of this Ruling, the ratio of total actual emissions reductions to the emissions increase shall be at least 1:1 unless an alternative ratio is provided for the applicable nonattainment area in paragraphs IV. G. 2. to IV. G. 4.

2. In meeting the emissions offset requirements of paragraph IV. A., Condition 3 of this Ruling for ozone nonattainment areas that are subject to subpart 2, part D, title I of the Act, the ratio of total actual emissions reductions of VOC to the emissions increase of VOC shall be as follows:

(i) In any marginal nonattainment area for ozone—at least 1.1:1;

(ii) In any moderate nonattainment area for ozone—at least 1.15:1;

(iii) In any serious nonattainment area for ozone—at least 1.2:1;

(iv) In any severe nonattainment area for ozone—at least 1.3:1 (except that the ratio may be at least 1.2:1 if the State also requires all existing major sources

in such nonattainment area to use BACT for the control of VOC); and

(v) In any extreme nonattainment area for ozone—at least 1.5:1 (except that the ratio may be at least 1.2:1 if the State also requires all existing major sources in such nonattainment area to use BACT for the control of VOC);

3. Notwithstanding the requirements of paragraph IV.G. 2. of this Ruling for meeting the requirements of paragraph IV. A., Condition 3 of this Ruling, the ratio of total actual emissions reductions of VOC to the emissions increase of VOC shall be at least 1.15:1 for all areas within an ozone transport region that is subject to subpart 2, part D, title I of the Act, except for serious, severe, and extreme ozone nonattainment areas that are subject to subpart 2, part D, title I of the Act.

4. In meeting the emissions offset requirements of paragraph IV. A., Condition 3 of this Ruling for ozone nonattainment areas that are subject to subpart 1, part D, title I of the Act (but are not subject to subpart 2, part D, title I of the Act, including 8-hour ozone nonattainment areas subject to 40 CFR 51.902(b)), the ratio of total actual emissions reductions of VOC to the emissions increase of VOC shall be at least 1:1.

**PART 52—APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS**

5. The authority citation for part 52 continues to read as follows:

**Authority:** 42 U.S.C. 7401 *et seq.*

- 6. Section 52.21 is amended by:
  - a. Revising paragraphs (b)(23)(i), (b)(50)(i), (b)(50)(iii), and (i)(5)(ii);
  - b. Adding and reserving paragraph (b)(50)(v); and
  - c. Adding paragraphs (b)(50)(vi) and (i)(5)(iii) to read as follows:

**§ 52.21 Prevention of significant deterioration of air quality.**

\* \* \* \* \*

(b) \* \* \*

(23)(i) Significant means, in reference to a net emissions increase or the potential of a source to emit any of the following pollutants, a rate of emissions that would equal or exceed any of the following rates:

**Pollutant and Emissions Rate**

Carbon monoxide: 100 tons per year (tpy).

Nitrogen oxides: 40 tpy.

Sulfur dioxide: 40 tpy.

Particulate matter: 25 tpy of particulate matter emissions.

PM<sub>10</sub>: 15 tpy.

PM<sub>2.5</sub>: 10 tpy of PM<sub>2.5</sub> emissions; 40 tpy of sulfur dioxide emissions; 40 tpy

of nitrogen oxide emissions when identified as a PM<sub>2.5</sub> precursor under paragraph (b)(50) of this section.

Ozone: 40 tpy of volatile organic compounds.

Lead: 0.6 tpy.

Fluorides: 3 tpy.

Sulfuric acid mist: 7 tpy.

Hydrogen sulfide (H<sub>2</sub>S): 10 tpy.

Total reduced sulfur (including H<sub>2</sub>S): 10 tpy.

Reduced sulfur compounds (including H<sub>2</sub>S): 10 tpy.

Municipal waste combustor organics (measured as total tetra-through octa-chlorinated dibenzo-p-dioxins and dibenzofurans): 3.2 × 10<sup>-6</sup> megagrams per year (3.5 × 10<sup>-6</sup> tons per year).

Municipal waste combustor metals (measured as particulate matter): 14 megagrams per year (15 tons per year).

Municipal waste combustor acid gases (measured as sulfur dioxide and hydrogen chloride): 36 megagrams per year (40 tons per year).

Municipal solid waste landfills emissions (measured as nonmethane organic compounds): 45 megagrams per year (50 tons per year).

\* \* \* \* \*

(50) Regulated NSR pollutant, for purposes of this section, means the following:

(i) Any pollutant for which a national ambient air quality standard has been promulgated and any constituents or precursors for such pollutants.

Precursors identified by the Administrator for purposes of NSR are the following:

(A) Volatile organic compounds and nitrogen oxides are precursors to ozone in all attainment and unclassifiable areas.

(B) Sulfur dioxide is a precursor to PM<sub>2.5</sub> in all attainment and unclassifiable areas.

(C) Nitrogen oxides are presumed precursors to PM<sub>2.5</sub> in all attainment and unclassifiable areas, unless the State demonstrates to the Administrator's satisfaction that emissions of nitrogen oxides from stationary sources in a specific area are not a significant contributor to that area's ambient PM<sub>2.5</sub> concentrations and the area is not in a State identified by the Administrator as a source of a PM<sub>2.5</sub> interstate transport problem.

(D) Volatile organic compounds are presumed not to be precursors to PM<sub>2.5</sub> in any attainment or unclassifiable area, unless the State demonstrates to the Administrator's satisfaction that emissions of volatile organic compounds from stationary sources in a specific area are a significant

contributor to that area's ambient PM<sub>2.5</sub> concentrations.

\* \* \* \* \*

(iii) Any Class I or II substance subject to a standard promulgated under or established by title VI of the Act;

\* \* \* \* \*

(v) [Reserved.];

(vi) Particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) emissions include gaseous emissions from a source or activity which condense to form particulate matter at ambient temperatures.

\* \* \* \* \*

(i) \* \* \*

(5) \* \* \*

(ii) The concentrations of the pollutant in the area that the source or

modification would affect are less than the concentrations listed in paragraph (i)(5)(i) of this section; or

(iii) The pollutant is not listed in paragraph (i)(5)(i) of this section.

\* \* \* \* \*

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