

The EPA Administrator, Lisa P. Jackson, signed the following proposed rule on 12/01/10, and EPA is submitting it for publication in the *Federal Register* (FR). While we have taken steps to ensure the accuracy of this Internet version of the rule, it is not the official version of the rule for purposes of compliance. Please refer to the official version in a forthcoming FR publication, which will appear on the Government Printing Office's FDSys website (<http://fdsys.gpo.gov/fdsys/search/home.action>) and on Regulations.gov (<http://www.regulations.gov>) in Docket No. EPA-HQ-OAR-2008-0348. Once the official version of this document is published in the FR, this version will be removed from the Internet and replaced with a link to the official version.

6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 51

[EPA-HQ-OAR-2008-0348; FRL-8784-5]

RIN 2060-A058

**Methods for Measurement of Filterable PM₁₀ and PM_{2.5} and
Measurement of Condensable PM Emissions from Stationary
Sources**

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: This action promulgates amendments to Methods 201A and 202. The final amendments to Method 201A add a particle-sizing device to allow for sampling of particulate matter with mean aerodynamic diameters less than or equal to 2.5 micrometers (PM_{2.5} or fine particulate matter). The final amendments to Method 202 revise the sample collection and recovery procedures of the method to reduce the formation of reaction artifacts that could lead to inaccurate measurements of condensable particulate matter. Additionally, the final amendments to Method 202 eliminate

This document is a prepublication version, signed by EPA Administrator, Lisa P. Jackson on 12/01/2010. We have taken steps to ensure the accuracy of this version, but it is not the official version.

most of the hardware and analytical options in the existing method, thereby increasing the precision of the method and improving the consistency in the measurements obtained between source tests performed under different regulatory authorities.

This action also announces that EPA is taking no action to affect the already established January 1, 2011 sunset date for the New Source Review (NSR) transition period, during which EPA is not requiring that State NSR programs address condensable particulate matter emissions.

DATES: This final action is effective on January 1, 2011.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2008-0348. All documents are listed in the <http://www.regulations.gov> index.

Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy form. Publicly available docket materials are available either electronically at <http://www.regulations.gov> or in hard copy at the EPA Docket Center EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW, Washington, DC. The 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 Center is (202) 566-1742.

FOR FURTHER INFORMATION CONTACT: For general information, contact Ms. Candace Sorrell, U.S. EPA, Office of Air Quality Planning and Standards, Air Quality Assessment Division, Measurement Technology Group (E143-02), Research Triangle Park, NC 27711; telephone number: (919) 541-1064; fax number; (919) 541-0516; e-mail address: sorrell.candace@epa.gov. For technical questions, contact Mr. Ron Myers, U.S. EPA, Office of Air Quality Planning and Standards, Sector Policies and Programs Division, Measurement Policy Group (D243-05), Research Triangle Park, NC 27711; telephone number: (919) 541-5407; fax number: (919) 541-1039; e-mail address: myers.ron@epa.gov.

Acronyms and Abbreviations. The following acronyms and abbreviations are used in this document.

Δp_{\max}	maximum velocity pressure
Δp_{\min}	minimum velocity pressure
μm	micrometers
ASTM	American Society for Testing and Materials
AWMA	Air and Waste Management Association
CAA	Clean Air Act
CBI	confidential business information
CCM	Controlled Condensation Method
CPM	condensable PM

DOP	dioctyl phthalate
DOT	Department of Transportation
DQO	data quality objective
MSHA	Mine Safety and Health Administration
NAAQS	National Ambient Air Quality Standards
NSR	New Source Review
NTTAA	National Technology Transfer and Advancement Act of 1995
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PM	particulate matter
PM ₁₀	particulate matter less than or equal to 10 micrometers
PM _{2.5}	particulate matter less than or equal to 2.5 micrometers
ppmw	parts per million by weight
PTFE	polytetrafluoropolymer
RCRA	Resource Conservation and Recovery Act
RFA	Regulatory Flexibility Act
SBA	Small Business Administration
SIP	State Implementation Plan
SO ₂	sulfur dioxide
TDS	total dissolved solids
TTN	Technology Transfer Network
UMRA	Unfunded Mandates Reform Act
www	Worldwide Web

SUPPLEMENTARY INFORMATION: The information in this preamble is organized as follows:

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I. General Information

A. Does this action apply to me?

This action applies to you if you operate a stationary source that is subject to applicable requirements to control or measure total particulate matter (PM), total PM with mean aerodynamic diameters less than or equal to 10

micrometers (μm) (PM_{10}), or total $\text{PM}_{2.5}$, where EPA Method 202 is incorporated as a component of the applicable test method.

In addition, this action applies to you if federal, State, or local agencies take certain additional independent actions. For example, this action applies to sources through actions by State and local agencies that implement condensable PM (CPM) control measures to attain the National Ambient Air Quality Standards (NAAQS) for $\text{PM}_{2.5}$ and specify the use of Method 202 to demonstrate compliance with the control measures. State and local agencies that specify the use of Method 201A or 202 would have to implement the following: (1) adopt this method in rules or permits (either by incorporation by reference or by duplicating the method in its entirety), and (2) promulgate an emissions limit requiring the use of Method 201A or 202 (or an incorporated method based upon Method 201A or 202). This action also applies to stationary sources that are required to meet new applicable CPM requirements established through federal or State permits or rules, such as New Source Performance Standards and New Source Review (NSR), which specify the use of Method 201A or 202 to demonstrate compliance with the control measures.

The source categories and entities potentially affected include, but are not limited to, the following:

Category	NAICS^a	Examples of Regulated Entities
Industry	332410	Fossil fuel steam generators.
	332410	Industrial, commercial, institutional steam generating units.
	332410	Electricity generating units.
	324110	Petroleum refineries.
	562213	Municipal waste combustors.
	322110	Pulp and paper mills.
	325188	Sulfuric acid plants.
	327310	Portland cement plants.
	327410	Lime manufacturing plants.
	211111 212111 212112 212113	Coal preparation plants.
	331312 331314	Primary and secondary aluminum plants.
	331111 331513	Iron and steel plants.
	321219 321211 321212	Plywood and reconstituted products plants.

^aNorth American Industrial Classification System.

B. Where can I obtain a copy of this action and other related information?

In addition to being available in the docket, an electronic copy of these final rules are also available on the Worldwide Web (<http://www.epa.gov/ttn/>) through the Technology Transfer Network (TTN). Following the Administrator's signature, a copy of these final rules will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at

<http://www.epa.gov/ttn/oarpg>. The TTN provides information and technology exchange in various areas of air pollution control.

C. What is the effective date?

The final rule amendments are effective on January 1, 2011. Section 553(d) of the Administrative Procedure Act (APA), 5 U.S.C. Chapter 5, generally provides that rules may not take effect earlier than 30 days after they are published in the Federal Register. EPA is issuing this final rule under section 307(d)(1) of the Clean Air Act, which states: "The provisions of section 553 through 557 . . . of Title 5 shall not, except as expressly provided in this section, apply to actions to which this subsection applies." Thus, section 553(d) of the APA does not apply to this rule. EPA is nevertheless acting consistently with the purposes underlying APA section 553(d) in making this rule effective on January 1, 2011. Section 5 U.S.C. 553(d)(3) allows an effective date less than 30 days after publication "as otherwise provided by the agency for good cause found and published with the rule." As explained below, EPA finds that there is good cause for these rules to become effective on or before January 1, 2011, even if this date is not 30 days from date of publication in the Federal Register.

While this action is being signed by December 1, 2010, there may be a delay in the publication of this rule as it contains many complex diagrams, equations, and charts, and is relatively long. The purpose of the 30-day waiting period prescribed in 5 U.S.C. 553(d) is to give affected parties a reasonable time to adjust their behavior and prepare before the final rule takes effect. Where, as here, the final rule will be signed and made available on the EPA website at least 30 days before the effective date, but where the publication may be delayed due to the complexity and length of the rule, that purpose is still met. Moreover, since permitting authorities and regulated entities may need to rely on the methods described in these rules to carry out requirements of the SIP and NSR implementation rules that become effective on January 1, 2011 (see section III.C, *infra*), there would be unnecessary regulatory confusion if a publication delay caused this rule to become effective after January 1, 2011. Accordingly, we find good cause exists to make this rule effective on January 1, 2011, consistent with the purposes of 5 U.S.C. 553(d) (3).

D. Judicial Review

Under section 307(b) (1) of the Clean Air Act (CAA), judicial review of this final action is available only by

filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by [INSERT DATE 60 DAYS AFTER THE DATE OF PUBLICATION IN THE FEDERAL REGISTER]. Under CAA section 307(b)(2), the requirements established by this action may not be challenged separately in any civil or criminal proceedings brought by EPA to enforce these requirements.

Section 307(d)(7)(B) of the CAA further provides that “[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review.” This section also provides a mechanism for EPA to convene a proceeding for reconsideration, “[i]f the person raising an objection can demonstrate to EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule.” Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, Ariel Rios Building, 1200 Pennsylvania Ave., NW, Washington, DC 20460, with a copy to both the

person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave., NW., Washington, DC 20460.

II. Background

A. Why is EPA issuing this final action?

Section 110 of the CAA, as amended (42 U.S.C. 7410), requires State and local air pollution control agencies to develop, and submit for EPA approval, State Implementation Plans (SIP) that provide for the attainment, maintenance, and enforcement of the NAAQS in each air quality control region (or portion thereof) within each State. The emissions inventories and analyses used in the State's attainment demonstrations must consider PM_{10} and $PM_{2.5}$ emissions from stationary sources that are significant contributors of primary PM_{10} and $PM_{2.5}$ emissions. Primary or direct emissions are the solid particles or liquid droplets emitted directly from an air emissions source or activity, and the gaseous emissions or liquid droplets from an air emissions source or activity that condense to form PM or liquid droplets at ambient temperatures.

Appendix A to subpart A of 40 CFR part 51

(Requirements for Preparation, Adoption, and Submittal of

Implementation Plans) defines primary PM_{10} and $PM_{2.5}$ as including both the filterable and condensable fractions of PM. Filterable PM consists of those particles that are directly emitted by a source as a solid or liquid at the stack (or similar release conditions) and captured on the filter of a stack test train. Condensable PM is the material that is in vapor phase at stack conditions but condenses and/or reacts upon cooling and dilution in the ambient air to form solid or liquid PM immediately after discharge from the stack. In response to the need to quantify primary PM_{10} and $PM_{2.5}$ emissions from stationary sources, EPA previously developed and promulgated Method 201A (Determination of PM_{10} Emissions (Constant Sampling Rate Procedure)) and Method 202 (Determination of Condensable Particulate Emissions from Stationary Sources) in 40 CFR part 51, appendix M (Recommended Test Methods for State Implementation Plans).

On April 17, 1990 (56 FR 65433), EPA promulgated Method 201A in appendix M of 40 CFR part 51 to provide a test method for measuring filterable PM_{10} emissions from stationary sources. In EPA Method 201A, a gas sample is extracted at a constant flow rate through an in-stack sizing device that directs particles with aerodynamic

diameters less than or equal to 10 μm to a filter. The particulate mass collected on the filter is determined gravimetrically after removal of uncombined water.

On December 17, 1991 (56 FR 65433), EPA promulgated Method 202 in appendix M of 40 CFR part 51 to provide a test method for measuring CPM from stationary sources. Method 202 uses water-filled impingers to cool, condense, and collect materials that are vaporous at stack conditions and become solid or liquid PM at ambient air temperatures. Method 202, as promulgated in 1991, contains several optional procedures that were intended to accommodate the various test methods used by State and local regulatory entities at the time Method 202 was being developed.

In this action, we are finalizing amendments to Methods 201A and 202 to improve the measurement of fine PM emissions. For Method 201A, the final amendments add a particle-sizing device to allow for sampling of $\text{PM}_{2.5}$ emissions. For Method 202, the final amendments will (1) revise the sample collection and recovery procedures of the method to reduce the potential for formation of reaction artifacts that are not related to the primary emission of CPM from the source but may be counted erroneously as CPM when using Method 202, and (2) eliminate most of the hardware and analytical options in the existing method.

These changes will increase the precision of Method 202 and improve the consistency in the measurements obtained between source tests performed under different regulatory authorities.

B. Particulate Matter National Ambient Air Quality Standards

Sections 108 and 109 of the CAA govern the establishment and revision of the NAAQS. Section 108 of the CAA (42 U.S.C. 7408) directs the Administrator to identify and list "air pollutants" that "in his judgment, may reasonably be anticipated to endanger public health and welfare" and whose "presence...in the ambient air results from numerous or diverse mobile or stationary sources" and to issue air quality criteria for those that are listed. Air quality criteria are intended to "accurately reflect the latest scientific knowledge useful in indicating the kind and extent of identifiable effects on public health or welfare which may be expected from the presence of [a] pollutant in ambient air...." Section 109 of the CAA (42 U.S.C. 7409) directs the Administrator to propose and promulgate primary and secondary NAAQS for pollutants listed under CAA section 108 to protect public health and welfare, respectively. Section 109 of the CAA also requires review of the NAAQS at 5-year intervals and that

an independent scientific review committee "shall complete a review of the criteria...and the national primary and secondary ambient air quality standards...and shall recommend to the Administrator any new...standards and revisions of existing criteria and standards as may be appropriate...." Since the early 1980s, this independent review function has been performed by the Clean Air Scientific Advisory Committee.

Initially, EPA established the PM NAAQS on April 30, 1971 (36 FR 8186), based on the original criteria document (Department of Health, Education, and Welfare, 1969). The reference method specified for determining attainment of the original standards was the high-volume sampler, which collects PM up to a nominal size of 25 to 45 μm (referred to as total suspended particulates or TSP). On October 2, 1979 (44 FR 56730), EPA announced the first periodic review of the air quality criteria and PM NAAQS, and significant revisions to the original standards were promulgated on July 1, 1987 (52 FR 24634). In that decision, EPA changed the indicator for particles from TSP to PM_{10} . When that rule was challenged, the court upheld revised standards in all respects. Natural Resources Defense Council v. Administrator, 902 F. 2d 962 (D.C. Cir. 1990, cert. denied, 498 U.S. 1082 (1991)).

In April 1994, EPA announced its plans for the second periodic review of the air quality criteria and PM NAAQS, and the Agency promulgated significant revisions to the NAAQS on July 18, 1997 (62 FR 38652). In that decision, EPA revised the PM NAAQS in several respects. While EPA determined that the PM NAAQS should continue to focus on particles less than or equal to 10 μm in diameter (PM_{10}), EPA also determined that the fine and coarse fractions of PM_{10} should be considered separately. EPA added new standards, using $\text{PM}_{2.5}$ as the indicator for fine particles (with $\text{PM}_{2.5}$ referring to particles with a nominal mean aerodynamic diameter less than or equal to 2.5 μm), and using PM_{10} as the indicator for purposes of regulating the coarse fraction of PM_{10} .

Following promulgation of the 1997 PM NAAQS, petitions for review were filed by a large number of parties addressing a broad range of issues. In May 1999, a three-judge panel of the U.S. Court of Appeals for the District of Columbia Circuit issued an initial decision that upheld EPA's decision to establish fine particle standards. American Trucking Associations v. EPA, 175 F.3d 1027, 1055 (D.C. Cir. 1999), reversed in part on other grounds in Whitman v. American Trucking Associations, 531 U.S. 457

(2001). The panel also found "ample support" for EPA's decision to regulate coarse particle pollution, but vacated the 1997 PM₁₀ standards concluding that EPA had not provided a reasonable explanation justifying use of PM₁₀ as an indicator for coarse particles. (Id. at 1054-55.) Pursuant to the court's decision, EPA removed the vacated 1997 PM₁₀ standards but retained the pre-existing 1987 PM₁₀ standards (65 FR 80776, December 22, 2000).

On October 23, 1997, EPA published its plans for the third periodic review of the air quality criteria and PM NAAQS (62 FR 55201), including the 1997 PM_{2.5}

standards and the 1987 PM₁₀ standards. On October 17, 2006, EPA issued its final decision to revise the primary and secondary PM NAAQS to provide increased protection of public health and welfare respectively (71 FR 61144). With regard to the primary and secondary standards for fine particles, EPA revised the level of the 24-hour PM_{2.5} standard to 35 µg per cubic meter (µg/m³), retained the level of the annual PM_{2.5} annual standard at 15 µg/m³, and revised the form of the annual PM_{2.5} standard by narrowing the constraints on the optional use of spatial averaging. With regard to the primary and secondary standards for PM₁₀,

EPA retained the 24-hour PM_{10} standard ($150 \mu\text{g}/\text{m}^3$) and revoked the annual standard because available evidence generally did not suggest a link between long-term exposure to current ambient levels of coarse particles and health or welfare effects.

C. Measuring PM Emissions

Section 110 of the CAA, as amended (42 U.S.C. 7410), requires State and local air pollution control agencies to develop and submit plans (SIP) for EPA approval that provide for the attainment, maintenance, and enforcement of the NAAQS in each air quality control region (or portion thereof) within such State. 40 CFR Part 51 (Requirements for Preparation, Adoption, and Submittal of Implementation Plans) specifies the requirements for SIP. Appendix A to subpart A of 40 CFR part 51, defines primary PM_{10} and $PM_{2.5}$ as including both the filterable and condensable fractions of PM. Filterable PM consists of those particles directly emitted by a source as a solid or liquid at the stack (or similar release conditions) and captured on the filter of a stack test train. Condensable PM is the material that is in vapor phase at stack conditions but which condenses and/or reacts upon cooling and dilution in the ambient air to form solid or liquid PM immediately after discharge from the stack.

Promulgation of the 1987 NAAQS created the need for methods to quantify PM_{10} emissions from stationary sources. In response, EPA developed and promulgated the following test methods:

- Method 201A - Determination of PM_{10} Emissions (Constant Sampling Rate Procedure), and
- Method 202 - Determination of Condensable Particulate Emissions from Stationary Sources.

1. Method 201A

Method 201A is a test method for measuring filterable PM_{10} emissions from stationary sources. With the exception of the PM_{10} -sizing device, the current Method 201A sampling train is the same as the sampling train used for EPA Method 17 of appendix A-3 to 40 CFR part 60.

Method 201A cannot be used to measure emissions from stacks that have entrained moisture droplets (e.g., from a wet scrubber stack) since these stacks may have water droplets that are larger than the cut size of the PM_{10} sizing device. The presence of moisture would prevent an accurate measurement of total PM_{10} since any PM_{10} dissolved in larger water droplets would not be collected by the sizing device and would consequently be excluded in determining total PM_{10} mass. To measure PM_{10} in stacks where

water droplets are known to exist, EPA's Technical Information Document 09 (Methods 201 and 201A in Presence of Water Droplets) recommends use of Method 5 of appendix A-3 to 40 CFR part 60 (or a comparable method) and consideration of the total particulate catch as PM_{10} emissions.

Method 201A is also not applicable for stacks with small diameters (i.e., 18 inches or less). The presence of the in-stack nozzle/cyclones and filter assembly in a small duct will cause significant cross-sectional area interference and blockage leading to incorrect flow calculation and particle size separation. Additionally, the type of metal used to construct the Method 201A cyclone may limit the applicability of the method when sampling at high stack temperatures (e.g., stainless steel cyclones are reported to gall and seize at temperatures greater than 260°C).

2. Method 202

Method 202 measures CPM from stationary sources. Method 202 contains several optional procedures that were intended to accommodate the various test methods used by State and local regulatory entities at the time Method 202 was being developed.

When conducted consistently and carefully, Method 202 provides acceptable precision for most emission sources. Method 202 has been used successfully in regulatory programs where the emission limits and compliance demonstrations are established based on a consistent application of the method and its associated options. However, when the same emission source is tested using different combinations of the optional procedures, there appear to be large variations in the measured CPM emissions. Additionally, during validation of the promulgated method, we determined that sulfur dioxide (SO₂) gas (a typical component of emissions from several types of stationary sources) can be absorbed partially in the impinger solutions and can react chemically to form sulfuric acid. This sulfuric acid "artifact" is not related to the primary emission of CPM from the source, but may be counted erroneously as CPM when using Method 202. We consistently maintain that the artifact formation can be reduced by at least 90 percent if a one-hour nitrogen purge of the impinger water is used to remove SO₂ before it can form sulfuric acid (this is our preferred application of the Method 202 optional procedures). Inappropriate use or omission of the preferred or optional procedures in Method 202 can increase the potential for artifact formation.

Considering the potential for variations in measured CPM emissions, we believe that further verification and refinement of Method 202 are appropriate to minimize the potential for artifact formation. We performed several studies to assess artifact formation when using Method 202. The results of our 1998 laboratory study and field evaluation commissioned to evaluate the impinger approach can be found in "Laboratory and Field Evaluation of EPA's Method 5 Impinger Catch for Measuring Condensable Matter from Stationary Sources" at <http://www.epa.gov/ttn/emc/methods/m202doc1.pdf>.

The 1998 study verified the need for a nitrogen purge when SO₂ is present in stack gas and provided guidance for analyzing the collected samples. In 2005, an EPA contractor conducted a second study, "Laboratory Evaluation of Method 202 to Determine Fate of SO₂ in Impinger Water," that replicated some of the earlier EPA work and addressed some additional issues. The report of that work is available at <http://www.epa.gov/ttn/emc/methods/m202doc2.pdf>. This report also verified the need for a nitrogen purge and identified the primary factors that affect artifact formation.

Also in 2005, a private testing contractor presented a possible minor modification to Method 202 at the Air and Waste Management Association (AWMA) specialty conference. The proposed modification, as described in their presentation titled "Optimized Method 202 Sampling Train to Minimize the Biases Associated with Method 202 Measurement of Condensable Particulate Matter Emissions," involved the elimination of water from the first impingers. The presentation (available at <http://www.epa.gov/ttn/emc/methods/m202doc3.pdf>) concluded that modification of the promulgated method to use dry impingers resulted in a significant additional reduction in the sulfate artifact.

In 2006, we began to conduct laboratory studies in collaboration with several stakeholders to characterize the artifact formation and other uncertainties associated with conducting Method 202 and to identify procedures that would minimize uncertainties when using Method 202. Since August 2006, we conducted two workshops in Research Triangle Park, NC to present and request comments on our plan for evaluating potential modifications to Method 202 that would reduce artifact formation, and also to discuss (1) our progress in characterizing the performance of the modified method, (2) issues that require additional investigation,

(3) the results of our laboratory studies, and (4) our commitments to extend the investigation through stakeholders external to EPA. Another meeting was held with experienced stack testers and vendors of emissions monitoring equipment to discuss hardware issues associated with modifications of the sampling equipment and the glassware for the proposed CPM test method. Summaries of the method evaluations, as well as meeting minutes from our workshops, can be found at <http://www.epa.gov/ttn/emc/methods/method202.html>.

The laboratory studies that were performed fulfill a commitment in the preamble to the Clean Air Fine Particle Implementation Rule (72 FR 20586, April 25, 2007) to examine the relationship between several critical CPM sampling and analysis parameters and, to the extent necessary, promulgate revisions to incorporate improvements in the method. While these improvements in the stationary source test method for CPM will provide for more accurate and precise measurement of all PM, the addition of PM_{2.5} as an indicator of health and welfare effects by the 1997 NAAQS revisions generates the need to quantify PM_{2.5} emissions from stationary sources. To respond to this need, we are promulgating revisions to incorporate this capability into the test method for filterable PM₁₀.

III. Summary of Changes Since Proposal

The methods in this final action contain several changes that were made as a result of public comments. The following sections present a summary of the changes to the methods. We explain the reasons for these changes in detail in the **Summary of Public Comments and Responses** section of this preamble.

A. Method 201A

Method 201A contains the following changes and clarifications:

- Revised Section 1.5 to clarify that Method 201A cannot be used to measure emissions from stacks that have entrained moisture droplets (e.g., from a wet scrubber stack).
- Removed the language in proposed Section 1.5 regarding ambient air contributions to PM. The decision to correct results for ambient air contributions is up to the permitting or regulatory authority.
- Added definitions of Primary PM, Filterable PM, Primary PM_{2.5}, Primary PM₁₀, and CPM to Section 3.0.
- Added a requirement to Sections 6.1.3 and 8.6.3 stating that the filter must not be compressed between the gasket and the filter housing.

- Clarified the sample recovery and analysis equipment in Section 6.2, including acceptable materials of construction, analytical balance, and fluoropolymer (polytetrafluoroethylene) beaker liners.
- Revised Section 6.2 to add performance-based, residual mass contribution specifications for containers rather than specifying the type of container that must be used (storage containers must not contribute more than 0.1 mg of residual mass to the CPM measurements).
- Revised Section 8.3.1 (regarding sampling ports) to state that a 4-inch port should be adequate for the single $PM_{2.5}$ (or single PM_{10}) sampling apparatus. However, testers will not be able to use conventional 4-inch ports if the combined dimension of the PM_{10} cyclone and the nozzle extending from the cyclone exceeds the internal diameter of the port.
- Clarified the sampling procedures in Section 8.3.1 for cases where the $PM_{2.5}$ cyclone is used without the PM_{10} cyclone. In these cases, samples are collected using the procedures specified in Section 11.3.2.2 of EPA Method 1, and the sampling time is extended at the replacement sampling point to include the duration of the unreachable traverse points.

- Revised Section 8.3.2.2 to clarify that Method 201A is not applicable for stack diameters less than 26.5 inches when the combined $PM_{10}/PM_{2.5}$ cyclone is used. The in-stack nozzle/cyclones and filter assembly in stacks less than 26.5 inches in diameter would cause significant cross-sectional area interference and blockage, leading to incorrect flow calculation and particle size separation.
- Revised Section 8.5.5 to express the maximum failure rate of values outside the minimum-maximum velocity pressure range in terms of percent of values outside the range instead of the number of traverse points outside the range.
- Revised section 8.6.1 to clarify that alternative designs are acceptable for fastening caps or covers to cyclones to avoid galling of the cyclone component threads in hot stacks. The method may be used at temperatures up to 1,000°F using stainless steel cyclones that are bolted together, rather than screwed together. Using "break-away" stainless steel bolts facilitates disassembly and circumvents the problem of thread galling.

- Clarified sampling procedures in Section 8.7.3.3 to maintain the temperature of the cyclone sampling head within $\pm 10^{\circ}\text{C}$ of the stack temperature and to maintain flow until after removing and before inserting the sampling head.
- Revised Section 11.2.7 to allow the use of tared fluoropolymer beaker liners for the acetone field reagent blank.

B. Method 202

Method 202 contains the following changes and clarifications:

- Clarified the terminology used to refer to laboratory and field blanks throughout the method.
- For health and safety reasons, replaced the use of methylene chloride with hexane throughout the method.
- Clarified Section 1.2 by moving the discussion of filterable PM methods used in conjunction with Method 202 to Section 1.5.
- Clarified Section 1.6 to specify that Method 202 can be used for measuring CPM in stacks that contain entrained moisture if the sampling temperature is sufficiently high to keep the moisture in the vapor phase.

- Moved the recommendation to develop a health and safety plan from Section 9.4 to Section 5.0.
- Added amber glass bottles to the list of sample recovery equipment in Section 6.2.
- Added alternatives (fluoropolymer beaker liners or fluoropolymer baggies) to weighing tins to the list of analytical equipment in Section 6.2.2 (Section 6.3 of the proposed method).
- Added specifications for sample drying equipment in Section 6.2.2 (Section 6.3 of the proposed method).
- Clarified Section 6.3.7 regarding the use of an analytical balance with sensitivity to 0.00001 g (0.01 milligram).
- Added an option to use a colorimetric pH indicator instead of a pH meter in Section 6.2.2 (Section 6.3 of the proposed method).
- Added a sonication device to the list of analytical equipment in Section 6.2.2 (Section 6.3 of the proposed method).
- Added performance-based, residual mass contribution specifications for containers and wash bottles in Section 6.2.2 (Section 6.3 of the proposed method)

rather than specifying the type of container that must be used.

- Replaced the prescriptive language regarding filter materials in Section 7.1.1 with performance-based requirements limiting the residual mass contribution.
- Replaced the prescriptive language regarding water quality in Section 7.1.3 with performance-based requirements for residual mass content.
- Clarified Section 8.2 to specify that cleaned glassware must be used at the start of each new source category tested at a single facility.
- Added a performance-based option to Section 8.4 to conduct a field train proof blank rather than meeting the glassware baking requirements in Section 8.2.
- Clarified the sampling train configuration for the nitrogen purge procedures in Section 8.5.3.2 regarding pressurized purges.

C. How will the final amendments to methods 201A and 202 affect existing emission inventories, emission standards, and permit programs?

We anticipate that over time the changes in the test methods finalized in this action will result in, among other positive outcomes, more accurate emissions

inventories of direct PM emissions and emissions standards that are more indicative of the actual impact of the source on the ambient air quality.

Accurate emission inventories are critical for regulatory agencies to develop the control strategies and demonstrations necessary to attain air quality standards. When implemented, the test method revisions should improve our understanding of PM emissions due to the increased availability of more accurate emission tests and eventually through the incorporation of less biased test data into existing emissions factors. For CPM, the use of the revised method could reveal a reduced level of CPM emissions from a source compared to the emissions that would have been measured using Method 202 as typically performed. However, there may be some cases where the revised test method would reveal an increased level of CPM emissions from a source, depending on the relative emissions of filterable and CPM emissions from the source. For example, the existing Method 202 allows complete evaporation of the water containing inorganic PM at 105°C (221°F), where the revised method requires the last 10 ml of the water to be evaporated at room temperature (not to exceed 30°C (85°F)), thereby retaining the CPM that would evaporate at the increased temperature.

Prior to our adoption of the 1997 PM_{2.5} NAAQS, several State and local air pollution control agencies had developed emission inventories that included CPM. Additionally, some agencies established enforceable CPM emissions limits or otherwise required that PM emissions testing include measurement of CPM. While this approach was viable in cases where the same test method was used to develop the CPM regulatory limits and to demonstrate facility compliance, there are substantial inconsistencies within and between States regarding the completeness and accuracy of CPM emission inventories and the test methods used to measure CPM emissions and demonstrate facility compliance.

These amendments would serve to mitigate the potential difficulties that can arise when EPA and other regulatory entities attempt to use the test data from State and local agencies with inconsistent CPM test methods to develop emission factors, determine program applicability, or to establish emissions limits for CPM emission sources within a particular jurisdiction. For example, problems can arise when the test method used to develop a CPM emission limit is not the same as the test method specified in the rule for demonstrating compliance because the different test methods may quantify different components of PM (e.g.,

filterable versus condensable). Also, when emissions from State inventories are modeled to assess compliance with the NAAQS, the determination of direct PM emissions may be biased high or low, depending on the test methods used to estimate PM emissions, and the atmospheric conversion of SO₂ to sulfates (or sulfur trioxide, SO₃) may be inaccurate or double-counted. Additionally, some State and local regulatory authorities have assumed that EPA Method 5 of appendix A-3 to 40 CFR part 60 (Determination of Particulate Matter Emissions from Stationary Sources) provides a reasonable estimate of PM₁₀ emissions. This assumption is incorrect because Method 5 does not provide particle sizing of the filterable component and does not quantify particulate caught in the impinger portion of the sampling train. Similar assumptions for measurements of PM_{2.5} will result in greater inaccuracies.

With regard to State permitting programs, we recognize that, in some cases, existing best available control technology, lowest achievable emission rate, or reasonably available control technology limits have been based on an identified control technology, and that the data used to determine the performance of that technology and to establish the limits may have focused on filterable PM and,

thus, did not completely characterize PM emissions to the ambient air. While the source test methods used by State programs that developed the applicable permit limit may not have fully characterized the PM emissions, we have no information that would indicate that the test methods are inappropriate indicators of the control technologies' performance for the portion of PM emissions that was addressed by the applicable requirement. As promulgated in the Clean Air Fine Particle Implementation Rule, after January 1, 2011, States are required to consider inclusion of CPM emissions in new or revised emissions limits that they establish. We will defer to the individual State's judgment as to whether, and at what time it is appropriate to revise existing facility emission limits or operating permits to incorporate information from the revised CPM test method when it is promulgated.

With regard to operating permits, the title V permit program does not generally impose new substantive air quality control requirements. In general, after emissions limits are established as CAA requirements under the SIP or a SIP-approved pre-construction review permit, they are included in the title V permits. Obviously, title V permits should be updated to reflect any revision of existing emission limits or new emission limits created in

the context of the underlying applicable requirements. Also, if a permit contains previously promulgated test methods, it is not a given that the permit would always have to be revised should these test method changes be finalized (e.g., where test methods are incorporated into existing permits through incorporation by reference, no permit terms or conditions would necessarily have to change to reflect changes to those test methods). In any event, the need for action related to emissions source permitting, due to these changes to the test methods, would be determined based upon several factors such as the exact wording of the existing operating permit, the requirements of the EPA-approved SIP, and any changes that may need to be made to pre-construction review permits with respect to CPM measurement (e.g., emissions estimates may be based upon a source test method that did not measure CPM or upon a set of Method 202 procedures that underestimated CPM emissions).

In recognition of these issues, the Clean Air Fine Particle Implementation Rule contains provisions establishing a transition period for developing emission limits for condensable direct $PM_{2.5}$ that are needed to demonstrate attainment of the $PM_{2.5}$ NAAQS. The transition period for CPM is the time period during which the new

rules and NSR permits issued to stationary sources are not required to address the condensable fraction of the sources' PM emissions. The end date of the transition period (January 1, 2011) was adopted in the final Clean Air Fine Particle Implementation Rule (72 FR 20586, April 25, 2007) and in the final Implementation of the New Source Review Program for Particulate Matter Less Than 2.5 Micrometers (PM_{2.5}) rule (73 FR 28321, May 16, 2008). As discussed in these two rules, the intent of the transition period (which ends January 1, 2011) was to allow time for EPA to issue a CPM test method through notice and comment rulemaking, and for sources and States to collect additional total primary (filterable and condensable) PM_{2.5} emissions data to improve emissions information to the extent possible. In the PM_{2.5} NSR Implementation Rule, we stated that as part of this test methods rulemaking, we would "take comment on an earlier closing date for the transition period in the NSR program if we are on track to meet our expectation to complete the test method rule much earlier than January 1, 2011" (73 FR 28344). In the notice of proposed rulemaking for this final rule on amendments to Method 201A and 202, EPA sought comment on whether to end the NSR transition period for CPM early (74 FR 12976). In this final rule, EPA is taking no action to affect the

already established January 1, 2011 sunset date for the NSR transition period.

Source test data collected with the use of this updated test method will be incorporated into the tools (e.g., emission factors, emission inventories, air quality modeling) used to demonstrate the attainment of air quality standards. Areas that are designated nonattainment for the 1997 $PM_{2.5}$ NAAQS, and that have approved attainment dates of 2014 or 2015, are required to develop a mid-course review in 2011. If it is determined that additional control measures are needed to ensure the area will be on track to attain the standard by the attainment date, any new direct $PM_{2.5}$ emission limits adopted by the State must address the condensable fraction and the filterable fraction of $PM_{2.5}$. Additionally, the new test data could be used to improve the applicability and performance evaluations of various control technologies.

IV. Summary of Final Methods

A. Method 201A

Method 201A measures PM emissions from stationary sources. The amendments to Method 201A add a $PM_{2.5}$ measurement device ($PM_{2.5}$ cyclone) that allows the method to measure filterable $PM_{2.5}$, filterable PM_{10} , or both filterable

PM_{2.5} and filterable PM₁₀. The method can also be used to measure coarse particles (i.e., the difference between measured PM₁₀ concentration and the measured PM_{2.5} concentration).

The amendments also add a PM_{2.5} cyclone to create a sampling train that includes a total of two cyclones (one cyclone to segregate particles with aerodynamic diameters greater than 10 µm and one cyclone to segregate particles with aerodynamic diameters greater than 2.5 µm) and a final filter to collect particles with aerodynamic diameters less than or equal to 2.5 µm. The PM_{2.5} cyclone is inserted between the PM₁₀ cyclone and the filter of the Method 201A sampling train.

The revised method has several limitations. The method cannot be used to measure emissions from stacks that have entrained moisture droplets (e.g., from a wet scrubber stack) because size separation of the water droplets is not representative of the dry particle size released into the air. In addition, the method is not applicable for stacks with diameters less than 25.7 inches when the combined PM₁₀/PM_{2.5} cyclone is used. Also, the method may not be suitable for sources with stack gas temperatures exceeding 260°C (500°F) when cyclones with screw-together caps are

used because the threads of the cyclone components may gall or seize, thus preventing the recovery of the collected PM. However, the method may be used at temperatures up to 1,000°F when using stainless steel cyclones that are bolted together rather than screwed together. Using "break-away" stainless steel bolts facilitates disassembly and circumvents the problem of thread galling. The method may also be used at temperatures up to 2,500°F when using specialty high-temperature alloys.

B. Method 202

Method 202 measures concentrations of CPM in stationary source sample gas after the filterable PM has been removed using another test method such as Method 5, 17, or 201A. The CPM sampling train begins at the back half of the filterable PM filter holder and consists of a condenser, two dry impingers (temperatures maintained to less than 30°C (85°F)), and a CPM filter (temperature maintained between 20°C (65°F) and 30°C (85°F)). During the test, sample gases are cooled and CPM is collected in the dry impingers and on the CPM filter. As soon as possible after the post-test leak check has been conducted, any water collected in the dry impingers is purged with

nitrogen gas for at least one hour to remove dissolved SO₂ gas.

After the nitrogen purge, the sampling train components downstream of the filterable PM filter (i.e., the probe extension (if any), condenser, impingers, front half of CPM filter holder, and the CPM filter) are rinsed with water to recover the inorganic CPM. The water rinse is followed by an acetone rinse and a hexane rinse to recover the organic CPM. The CPM filter is extracted using water to recover the inorganic components and hexane to recover the organic portion. The inorganic and organic fractions are then dried and the residues weighed. The sum of both fractions represents the total CPM collected by Method 202.

V. Summary of Public Comments and Responses

In response to the March 25, 2009 proposed revisions to EPA Methods 201A and 202, EPA received public comment letters from industry representatives, trade associations, State agencies, and environmental organizations. The public comments submitted to EPA addressed the proposed revisions to Methods 201A and 202 and our request for comments on whether to end the transition period for CPM in the NSR program on a date earlier than the current end date of January 1, 2011.

This section provides responses to the more significant public comments received on the proposed revisions to Methods 201A and 202. Summaries and responses for all comments related to the proposed revisions to Methods 201A and 202, including those addressed in this preamble, are contained in the response to comments document located in the docket for this final action (Docket ID No. EPA-HQ-OAR-2008-0348).

A. Method 201A

1. Speciation

Comment: One commenter stated that EPA should include guidance in Method 201A concerning speciation of the constituents present in the PM_{10} , $PM_{10}-PM_{2.5}$, and $PM_{2.5}$ size fractions. The commenter believes this information should be provided to support the use of speciated PM_{10} , $PM_{10}-PM_{2.5}$, and $PM_{2.5}$ data in source apportionment studies.

Response: EPA did not revise the method to provide guidance for speciation of various particle fractions for source apportionment because Method 201A is not a speciation method. However, with judicious selection of filter media, sources may use this method for speciating the less volatile metals and use these data in source apportionment studies. Including details to adapt this method for speciation analysis would unduly increase the

complexity of the method without increasing the precision of the mass measurements.

2. Catch Weight and Sampling Times

Comment: Several commenters requested that EPA specify the minimum solids catch weights needed in the PM_{10} and $PM_{2.5}$ size fractions to help testing organizations determine the necessary sampling times, especially for sources with low PM concentrations. Other commenters expressed concern about extended sampling times that would be necessary to obtain enough sample to weigh accurately. One commenter stated that a reasonable limit must be put on sampling volume to limit potentially unnecessary sampling time and exorbitant stack testing costs that could quickly escalate with such a requirement.

Response: We agree with the commenters that collecting sufficient weighable mass is important for the method to be precise. We also understand that the sampling rate used to attain the cyclone cut-points is typically less than the rate used during Method 5 sampling. However, EPA did not revise the method to dictate a minimum sampling volume or minimum catch weight that would be necessary to obtain a valid sample. One reason for not specifying a minimum sampling volume or minimum catch weight is that different regulatory authorities and testing programs have

differing measurement goals. For example, some regulatory authorities will accept less precision if results are well below compliance limits. State agencies or individual regulated facilities may develop data quality objectives (DQO) for the test program, which may specify minimum detection limits, and/or minimum sample volume, and/or catch weight that would demonstrate that DQO can be met. Stack samplers should take into consideration the compliance limits set by their regulatory authority and determine the minimum amount of stack gas needed to show compliance if the mass of particulate is below the detection limit.

Stack testers can use the minimum detection limit to determine the minimum stack gas volume. The stack tester may be able to estimate the necessary stack gas volume based on how much PM the source or source category is expected to emit (which could be determined from a previous test or from knowledge of the emissions for that source category).

Alternatively, the minimum detection limit for a source can be determined by calculating the percent relative standard deviation for a series of field train recovery blanks. You will not be able to measure below the average train recovery blank level, and EPA recommends

calculating a tester-specific detection limit by multiplying the standard deviation of field recovery train blanks by the appropriate "Student's t value" (e.g., for seven field train recovery blanks, the standard deviation of the results would be multiplied by three). Short of having Method 201A field recovery train blanks for cyclone and filter components of the sampling train, you may use the detection limit determined from EPA field tests.

An estimated detection limit was determined from an EPA field evaluation of proposed Method 201A (see "Field Evaluation of an Improved Method for Sampling and Analysis of Filterable and Condensable PM," Docket ID No. EPA-HQ-OAR-2008-0348). The estimated detection limit was calculated from the standard deviation of the differences from 10 quadruplicate sampling runs multiplied by the appropriate "Student's t value" ($n-1 = 9$). Detection limits determined in this manner were (1) total filterable PM: 2.54 mg; (2) PM_{10} : 1.44 mg; and (3) $PM_{2.5}$: 1.35. These test runs showed more filterable particulate in the $PM_{2.5}$ fraction, and total filterable particulate detection limits may be biased high due to the small particulate mass collected in the fraction greater than PM_{10} .

Comment: Two commenters questioned the use of reference methods to correct for ambient air in Section 1.5

of the proposed Method 201A. One commenter believed that the statement would be used as a means to blame non-compliance on ambient contributions and would result in legal challenges and disputes of test results. The other commenter questioned whether it was the intent of EPA to not allow the use of the CPM test method for low-temperature sources.

Response: We agree with the commenters that Section 1.5 of the proposed method was unclear. Thus, Section 1.5 (Additional Methods) has been removed from the final method. For sources that have very low PM emissions, such as processes that burn clean fuels (e.g., natural gas) and/or use large volumes of dilution air (e.g., gas turbines and thermal oxidizers), any ambient air particulate introduced into the process operation could be a large component of total outlet PM emissions. However, the decision to correct results for fine PM measurements to account for ambient air contributions is up to the permitting or regulatory authority. It is likely that these adjustments would be limited to gas turbines and possibly sources fired with clean natural gas.

Comment: Commenters expressed concern about the lack of a test method to measure $PM_{2.5}$ in stacks with entrained moisture. Another commenter urged EPA to continue work to

identify or develop a method for measuring filterable (or total) PM at sources with entrained moisture droplets in the stack (e.g., units with wet stacks due to wet flue gas desulfurization or wet scrubbers). Commenters requested that EPA provide guidance or identify a viable alternative for high-moisture stacks as soon as possible. One commenter stated that when conducting emission testing at facilities with similar wet stack conditions as described in the proposal preamble (74 FR 12973), that they support EPA's position on the limitations of the proposed Method 201A.

One commenter was not satisfied with the use of Method 5 as the only acceptable method for sources with entrained water droplets. To provide more accurate emissions data for sources with "wet" stacks, the commenter is sponsoring the development of an advanced manual sampling technique that can accurately measure filterable PM_{2.5} in stacks with entrained water droplets. The commenter expects to complete field tests of this method in the near future. The commenter will share laboratory and field test evaluations of this new method. The commenter believes that this new method for filterable PM_{2.5} emissions in "wet" stacks will be highly compatible with proposed Method 201A for filterable PM_{2.5} emission testing in "dry" stacks.

Response: We are currently developing a method to measure PM in stacks with saturated water vapors and laboratory testing is ongoing. EPA has committed a significant budget and personnel to developing an acceptable method for sources with wet stacks and we plan to offer the method and protocol as soon as possible. EPA's method development and evaluation are focused on the "Dried Particle Method" (See "Lab Work to Evaluate PM_{2.5} Collection with a Dilution Monitoring Device for Data Gathering for Emission Factor Development (Final Report)" in Docket ID No. EPA-HQ-OAR-2008-0348) that directly measures the mass emission rate of particles with specified aerodynamic size. In the meantime, the promulgated amendments to Methods 201A and 202 improve their performance and reduce known artifacts. Testers should use these final, amended methods until a PM_{2.5} method for stack gases containing water droplets is promulgated.

Regarding the advanced manual sampling technique that the commenter is currently developing for use in "wet" stacks, EPA acknowledges the sampling evaluations being conducted by the commenter. When the data become available, we will review the data to determine if the consistency and performance achieved by the advanced manual sampling technique referenced by the commenter are

comparable to EPA's wet-stack sampling method currently under development. If the data are comparable, we will consider whether the commenter's sampling technique should be addressed (e.g., as an alternative method) when we propose an EPA wet-stack, particle-sizing method in the future.

Comment: Several commenters disagreed with EPA's recommendation to use Method 5 on stacks with entrained moisture and to consider all the collected mass to be $PM_{2.5}$. Commenters stated that the categorization of all PM measured by Method 5 as $PM_{2.5}$ overstates the true emissions. One commenter supported EPA's recommendation to use Method 5 to determine $PM_{10}/PM_{2.5}$ filterable mass when measuring emissions following a wet scrubber. Another commenter stated that when conducting emissions testing at facilities with similar wet stack conditions, as described in the proposal preamble (74 FR 12973), they supported EPA's position on the limitations of the proposed Method 201A.

Response: EPA acknowledges that using Method 5 on stacks with entrained moisture and assuming that the catch is $PM_{2.5}$ can potentially overestimate $PM_{2.5}$ concentrations. EPA Method 5 measures total PM mass emissions from stationary sources. Method 5 does not specifically isolate

PM₁₀ or PM_{2.5}. Method 17, similar to Method 5, measures total PM mass emissions, but it uses an in-stack filter operating at stack temperature instead of a heated probe and out-of-stack heated filter and thus, is suitable for only dry sources.

Monitoring the emission of PM₁₀ or PM_{2.5} from a wet gas stream is a challenging problem that has not been addressed successfully despite considerable effort. A consensus method to provide this information has not emerged. EPA has determined that particulate from wet stacks is expected to be primarily PM₁₀ under most conditions typical of good wet scrubber design and operation. University of North Carolina particle physicists performed theoretical calculations based on a wet scrubber operating at 10,000 parts per million by weight (ppmw) total dissolved solids (TDS) with water droplets up to 50 µm in size (see "Development of Plans for Monitoring Emissions of PM_{2.5} and PM₁₀ from Stationary Sources With Wet Stacks," Docket ID No. EPA-HQ-OAR-2008-0348). They determined that water droplets under these conditions, when dried, would generate particles of 10 µm or less. Using the same theoretical basis (i.e., the ratio of TDS to water droplet size), EPA expects that water droplets up to 10 µm in size would

generate dried particles of 2 μm or less and that water droplets up to 20 μm would generate dried particles up to 4 μm or less.

Based on wet scrubber operation and typical mist eliminator performance, EPA has determined that the Method 5 filterable particulate measurements are a satisfactory approximation of $\text{PM}_{2.5}$ filterable particulate from controlled wet stack emissions. It is the States' or regulatory authorities' responsibility to interpret EPA's recommendation to use Method 5 when measuring PM in stacks containing water droplets and to consider all of the collected material to be $\text{PM}_{2.5}$.

Because a completely acceptable method for measuring $\text{PM}_{2.5}$ in wet stacks is not currently available, EPA understands the need to support the States with a $\text{PM}_{2.5}$ method for wet stacks. EPA is currently developing this method and laboratory testing is ongoing. EPA has committed a significant budget and personnel to developing an acceptable method for sources with wet stacks, as explained above. In the meantime, the promulgated amendments to Methods 201A and 202 improve their performance and reduce known artifacts. Testers should use

these final, amended methods until a $PM_{2.5}$ method for wet stack conditions is promulgated.

Comment: Several commenters expressed concern about the limitation of the method for stack temperatures greater than 500°F. One commenter asked that EPA investigate a possible modification to the method to utilize sampling equipment that can withstand higher stack temperatures. The commenter also introduced the possibility of moving the particle sizing device, at least for $PM_{2.5}$, out of the stack and into a heated box, enabling use of a glass-lined probe for sampling. Another commenter stated that the operator of a hot stack should not be required to "take extraordinary measures" (such as using the metal Inconel) when such measures are not defined in the method, no less tested in the field for accuracy. The commenter encouraged EPA to develop an acceptable substitute method for hot stacks. As an alternative, the commenter recommended that Method 5 testing, in conjunction with AP-42 particle size distribution data specific to glass furnaces, should be used for measurement of $PM_{2.5}$ in hot stacks.

Response: EPA investigated additional alternatives to allow the use of screwed together cyclones at elevated stack temperatures. As a result of this investigation, EPA

has revised Section 8.6.1 of Method 201A to allow the method to be used at temperatures up to 1,000°F (538°C) using stainless steel cyclones that are bolted together, rather than screwed together. Using "break-away" stainless steel bolts facilitates disassembly and circumvents the problem of thread galling. If the stainless steel bolts seize, over-torquing such bolts causes them to break at the bolt head, thus releasing the cyclones without damaging the cyclone flanges (see "Review of Draft EPA Test Methods 201A and 202 Related to the Use of High Temperature and Out-of-Stack Cyclone Collection," Southern Research Institute, EPA Docket ID No. EPA-HQ-OAR-2008-0348). The method can be used at temperatures up to 2,500°F using specially constructed high-temperature stainless steel alloys (Hastelloy or Haynes 230) with bolt-together closures using break-away bolts (see also "Development of Particle Size Test Methods for Sampling High Temperature and High Moisture Sources," California Environmental Protection Agency, Air Resources Board Research Division, 1994, NTIS PB95-170221).

Regarding the use of a heated box external to the stack to house the cyclones, EPA disagrees with this approach because of the potential for significant losses of particulate in the nozzle and probe liner. EPA expects

that transport losses for particles in the size range of interest would be significant enough to materially affect the measurement results. These losses would be caused by deposition primarily by impaction in the sampling nozzle (at the flow rates used in PM₁₀ and PM_{2.5} sampling) and settling losses in horizontal probes. (See "Review of Draft EPA Test Methods 201A and 202 Related to the Use of High Temperature and Out-of-Stack Cyclone Collection, Southern Research Institute," EPA Docket ID No. EPA-HQ-OAR-2008-0348.)

Sampling from ducts smaller than allowed by the blockage criteria or from ducts at high temperatures presents challenges that should be addressed by the source tester in conjunction with the regulatory authority. Method 201A does not permit the use of a nozzle and probe extension leading to an external heated oven to house the cyclones that would otherwise block stack flow or operate at stack temperatures beyond acceptable limits. Conventional screwed-together cyclones are designed to operate in stacks that have a blockage of less than three percent and have a temperature of less than 500°F.

Regarding the use of AP-42 as a replacement for PM₁₀ or PM_{2.5} compliance testing, EPA has determined that this is

not appropriate because of the uncertainty in the data due to variations in the particle sizing used to generate AP-42 emission factors. EPA's AP-42 particle-sizing data for sources controlled by wet scrubbers are based upon particle sizing methodologies that are affected by the same influences and uncertainties that make particle sizing in stacks with entrained water droplets a challenging technical issue. Particle-sizing information in AP-42 is based primarily upon data collected in the 1970s and early 1980s. The uncertainties associated with methods used during this period of time result in particle-sizing data that are dated and may not reflect the best sampling technology or the emissions from current control devices. Particle-sizing data from the 1970s employed many measurement methodologies that were found to introduce indeterminate biases in the particle sizing data. Also, source testers implemented measurement methods in different ways to deal with particle-sizing methodology and source-specific measurement challenges. The inconsistencies associated with addressing measurement challenges and indeterminate biases led to higher uncertainties associated with the measurement method results. Therefore, AP-42 should not be used as a replacement for contemporary emissions testing.

However, it may be acceptable to allow limited application of AP-42 particle size distributions as screening assessments when the underlying biases, uncertainties, and variations of the particle-sizing are taken into consideration. For example, one simple method involves using terms that include factors (such as the TDS of the recirculating scrubber water, estimated water droplet size distribution of the exit gas, and total liquid mass) that are already used to calculate approximate emission factors. Instruments are commercially available that can continuously monitor TDS and water flow rate, and the output from these instruments could feed into an emission factor to provide a continuous estimate of emissions that varies with process conditions. However, work needs to be done to evaluate the reliability and bias of this type of candidate estimation method. The required data inputs for this type of estimation model need to be identified and the likelihood that these inputs can be provided by the emission source needs to be confirmed. Once the input data can be readily obtained, the estimation model(s) needs to be evaluated to bring the most promising methods to fruition. (See "Development of Plans for Monitoring Emissions of $PM_{2.5}$ and PM_{10} from Stationary Sources with Wet Stacks, Department of Environmental

Sciences and Engineering, University of North Carolina at Chapel Hill under subcontract to MACTEC Federal Programs," EPA Contact No: EP-D-05-096, Work Assignment 2-05, August 2007; Docket ID No. EPA-HQ-OAR-2008-0348).

Comment: Several commenters requested changes to Section 6 of Method 201A regarding equipment and supplies. One commenter questioned the use of glass dishes and glass 250 ml beakers for drying the filter and rinses in proposed Method 201A. Another commenter stated that, at a minimum, the method should specify glass beakers, 50 ml weighing tins, and an analytical balance with a resolution of 0.00001 g (0.01 mg). One commenter recommended that polyethylene transfer/storage bottles should be allowed to minimize the chance of breakage when in the field.

Response: We revised Sections 6.2, 11.2.4, and 11.2.7 of Method 201A to allow the use of fluoropolymer beaker liners for evaporating the particulate rinse solvent and the acetone field reagent blank, desiccating particulate to constant weight, and weighing particulate samples in the final evaporation step. We revised Section 6.2, consistent with the commenter's suggestions, and added glass beakers and an analytical balance with a resolution of 0.00001 g (0.01 mg) to the sample recovery and analytical equipment list. However, we did not include weighing tins because we

determined that quantitative transfer of particles in acetone from a beaker to a weighing tin is not necessary and adds unnecessary imprecision to the final sample weight. Alternatively, EPA has changed the method to allow fluoropolymer beaker liners to be used to evaporate and weigh the samples.

EPA revised Section 6.2.1 of Method 201A by defining sample recovery items consistently with Method 5, except for wash bottles and sample storage bottles. Any container material is acceptable for wash bottles and storage bottles, but the container must not contribute more than 0.05 mg of residual mass to the CPM measurements.

Comment: Several commenters expressed concern about the proposed requirement to use a 6-inch sampling port. One commenter pointed out that using a 6-inch sampling port would be required only for the combined $PM_{10}/PM_{2.5}$ sampling apparatus. Another commenter stated that the physical dimensions of the cyclone would also cause problems with installation in the generally small fryer and dryer stacks. Another commenter noted that the partitioning of the filterable solids using bulky, in-stack cyclones creates several logistical and practical problems. The commenter stated that the size of the in-stack separation cyclones requires 6-inch to 8-inch sampling ports that do not exist

at the vast majority of stationary sources potentially affected by this final action.

Response: EPA understands the commenters' concerns regarding sampling port diameter requirements. However, facilities that are required to use Method 201A are responsible for ensuring that the stack has the appropriately sized sampling ports. The need for the larger port diameter has not changed from the requirement as stated in the 1990 version of this method. We revised Section 8.3.1 of Method 201A to more clearly describe when a 4-inch port may not accommodate the PM₁₀ particle-sizing cyclone and the nozzle that extends from the cyclone and to highlight the need for a larger port in such situations.

Comment: One commenter requested that EPA adjust the allowable number of traverse points that fall outside of the range of the Δp_{\min} and Δp_{\max} for cases in which more than the recommended maximum 12 traverse points are sampled by Method 201A. Many agencies require that more than the recommended maximum 12 traverse points be sampled if total filterable particulate is being determined. The commenter requested that the number of allowed out-of-range values be adjusted to match the stated failure rates expressed as percentages.

Response: EPA agrees that increasing the number of allowable traverse points outside the range Δp_{\min} and Δp_{\max} is appropriate when more than the recommended number of traverse points are sampled. EPA has modified Section 8.5.5 of the method to allow 16 percent failure rate rounded to the nearest whole number for $PM_{2.5}$ only and 8 percent failure rate rounded to the nearest whole number if the coarse fraction for PM_{10} determination is included.

Comment: One commenter requested that EPA add a new section in Section 8.3.2 to address ducts with diameters less than 18 inches. The commenter stated that the new section should state that ducts with diameters less than 18 inches have blockage effects ranging from five to ten percent. Therefore, according to the commenter, when a test is conducted on these small ducts, the observed velocity pressures must be adjusted for the estimated blockage factor whenever the combined sampling apparatus blocks more than three percent of the stack or duct.

For stacks smaller than 18 inches, one commenter asked if there would still be a blockage issue even when following the proposed Method 201A procedures, especially as the stack diameter gets smaller. The commenter also asked if there was a lower limit of stack diameter where the method cannot be used.

One commenter stated that when conducting emissions testing at facilities with similar small stack (less than 18 inches in diameter) conditions, as described in the proposal preamble (74 FR 12973), their experience supported EPA's position on the limitations of the proposed Method 201A. Another commenter pointed out an error in Section 8.7.2.3 that implied that the method could be used on stacks with diameters less than 18 inches.

Another commenter requested that if testing of stacks less than 18 inches in diameter is still allowed and the testers are required to use Method 1A, then the option of using a standard pitot tube should apply.

Response: We revised Section 8.7.2.3 of Method 201A to clarify the lower limits of stack diameter for different sampling configurations. The combined $PM_{10}/PM_{2.5}$ filter sampling head and pitot tube is not applicable for stacks with a diameter less than 26.5 inches because the blockage is greater than six percent. Blockage above six percent is not allowed for the combined $PM_{10}/PM_{2.5}$ filter sampling head and pitot tube. However, measurements for only $PM_{2.5}$ may be possible using only a $PM_{2.5}$ cyclone, pitot tube, and in-stack filter for stacks with a diameter less than 26.5 inches. If the blockage exceeds three percent but is less

than six percent in that configuration, you must follow the procedures outlined in Method 1A to conduct tests on stacks less than 26.5 inches in diameter. In addition, you must conduct the velocity traverse downstream of the sampling location or immediately before the test run.

We also modified Section 10.1 of the method to allow standard pitot tubes to be used downstream when significant blockage exists. As stated in Section 8.3.2.2, you must adjust the observed velocity pressures for the estimated blockage factor whenever the sampling apparatus blocks three to six percent of the stack or duct.

Comment: One commenter requested that the specification for the maximum allowable acetone blank value be changed from 0.001 percent by weight to either 1 ppmw or 0.0001 percent by weight to be consistent with the reagent specification stated in Section 7.2.1 of the method.

Response: We agree with the commenter that maximum allowable acetone blank value should be consistent with the reagent specification stated in Section 7.2.1. Thus, we revised Section 12.3.2.3 of the final method to specify the maximum allowable acetone blank in terms of weight per volume of acetone (0.1 mg per 100 ml solvent), rather than percent weight.

Comment: One commenter expressed concern about the approach in Section 12.3.2.3 of the proposed method. The commenter stated that subtracting the acetone blank mass from the individual sample masses would be acceptable if the volumes of the acetone rinses are all exactly 100 ml. However, according to the commenter, this was not reality, and the accuracy of determining the blank correction suffers from this approach. The commenter suggested that rather than subtracting the mass of the acetone rinse blank dry residue directly from the sample masses, the concentration of the acetone rinse blank should be calculated as the mg of dry residue per ml of acetone rinse blank volume limited to the concentration of residue at 1 ppmw. The commenter stated that this concentration of the dry residue would be multiplied by the volume of the acetone in ml used to collect and recover each sample from the sampling head. The commenter stated that the resulting mass would be subtracted from the dry residue mass determined for the sample of interest. According to the commenter, this approach will provide a more accurate determination of the dry residue mass from the acetone rinse blank due to processing a larger volume of acetone, and assessment of the blank mass correction for each sample as it will be proportional to the amount of acetone used to

collect each sample. The commenter stated that the liquid volume of the samples and blanks could be determined by either direct volumetric measurement or by multiplying the wet weight of the sample or blank by the density of the reagent at 20°C.

Response: We agree with the commenter and with the commenter's suggested equation. Therefore, we revised Section 12.3.2.3 of the final method to accommodate different acetone rinse volumes. However, the correction must be proportional to the amount of solvent used. Some testers may use more solvent due to heavy deposits that are difficult to remove, while other testers may use less solvent. Therefore, the maximum adjustment is 0.1 mg per 100 ml of the acetone used from the sample recovery.

B. Method 202

1. Extraction Solvent

Comment: Three commenters noted that methylene chloride is highly toxic. One commenter stated the use of methylene chloride poses significant exposure risks to field test personnel, plant personnel working in the area of the mobile laboratory, and agency test observers. Two commenters stated that Method 202 should specify a less toxic solvent than methylene chloride, such as n-hexane.

One commenter stated that EPA should sponsor a set of tests to confirm that n-hexane or another less-toxic solvent provides the sample rinse effectiveness as methylene chloride. Another commenter encouraged EPA to conduct future studies to identify a solvent to replace methylene chloride in Proposed Method 202 and in other EPA reference methods.

Another commenter stated that the use of methylene chloride (a known carcinogen) as the cleaning and recovery solvent will require safety departments to develop procedures for appropriate handling on-site and the use of personal protection equipment for personnel that may be exposed to the solvent. The commenter noted that toluene, which is used in EPA Method 23, is a technically acceptable alternative to methylene chloride. The commenter suggested that EPA review the use of toluene as a replacement for methylene chloride in Method 202 (and OTM 028).

Response: The extraction solvent specified in a particular test method is dependent on the analyte(s) of interest. If the target analyte is known, an appropriate solvent can be identified that has the desired recovery performance for that analyte. For Method 202, the pollutant measured by the method, CPM, is defined by the method (i.e., whatever remains after the sample recovery

procedures is considered to be CPM regardless of its analyte group). Although no single solvent is universally applicable to all analyte groups, methylene chloride was chosen for the proposed method based upon studies ("IERL-RTP Procedures Manual, Level 1, Environmental Assessment"; EPA-600/2-76-160a; June 1976) that showed it was the optimum solvent to recover polar and non-polar CPM.

We acknowledge the commenters' concerns regarding the toxicity of methylene chloride and the exposure hazards associated with its use, and we agree that the use of an alternative solvent is justified. However, because the recovery performance of solvents has been previously evaluated to support various EPA programs, we disagree with the commenters that additional studies are necessary to identify a suitable alternative solvent.

In identifying an alternative solvent, we initially considered specifying toluene because its extraction performance for non-polar compounds is similar to methylene chloride. However, because the vapor pressure of toluene is lower than methylene chloride, additional time would be needed to evaporate the organic samples to dryness at room temperature (30°C or less). Because the additional evaporation time would be an additional burden on testing contractors and present the risk of losing condensable

organic compounds, we rejected toluene as the replacement solvent.

We also evaluated the solvents used for organic compound recovery in the analytical methods developed by EPA's Office of Solid Waste (http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/3_series.htm). We reviewed EPA's "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), which was developed to support the Resource Conservation and Recovery Act (RCRA) program, to identify test methods that covered the same types of compounds expected to comprise CPM. Based upon our review of SW-846, we identified Method M-3550c (Ultrasonic Extraction) as a comparable method (M-3550c is used to extract semi-volatile organic compounds from waste samples). Section 7.4 of M-3550c, which discusses extraction solvents, lists the following extraction solvents by class of compound:

- Acetone/hexane or acetone/methylene chloride can be used to extract semivolatile organics.
- Acetone/hexane or acetone/methylene chloride can be used to extract organochlorine pesticides.

- Acetone/hexane, acetone/methylene chloride, or hexane can be used to extract polychlorinated biphenyls (PCB).

Of the above compound classes, the class that most closely relates to the type of high-molecular weight hydrocarbons expected to comprise organic CPM is PCB. Hexane is also listed as an alternative solvent (when used in combination with acetone) for the other compounds classes discussed in Section 7.4. Consequently, based upon this analysis, we have replaced methylene chloride with hexane in the final method.

2. Sample and Blank Containers

Comment: One commenter recommended that EPA revise the proposed method to specify the container type for each container (i.e., glass or plastic), and also whether the lid should have a Teflon® liner or whether another liner is acceptable.

Response: We disagree with the commenter that the method should specify the material of construction of containers used for sample and blank recovery procedures. Although we believe that the most appropriate containers are constructed of glass and equipped with a fluoropolymer lid, we also believe that testing contractors should have the flexibility to select the type of containers that meet

the performance specifications of the method. Therefore, we have revised the proposed method to add a performance-based specification for containers. Section 6.2.2 of the final method specifies that the containers used for sample and blank recovery procedures must not contribute more than 0.05 mg of residual mass to the CPM measurements.

Accompanying edits were also made to the CPM container language in Section 8.5.4 (Sample Recovery).

3. CPM Filter

Comment: One commenter suggested that the language in Section 7.1.1 of the proposed method be revised to replace the term "Filter" with "CPM Filter" and replace "Teflon[®]" with "Teflon[®], fluoropolymer or chemically equivalent." Another commenter stated that the final method should allow for alternatives to Teflon[®] filters, such as quartz, polytetrafluoropolymer (PTFE) coated, or PTFE filters.

Response: Based upon the comments received regarding the CPM filter, we revised the language in Section 7.1.1 to include performance-based specifications for the CPM filter rather than specifying a particular type of filter. Section 7.1.1 of the final method specifies that the CPM filter must be a non-reactive, non-disintegrating filter that does not contribute more than 0.5 mg of residual mass to the CPM measurements. The CPM filter must have an

efficiency of at least 99.95 percent (less than 0.05 percent penetration) on 0.3 μm particles. Documentation of the CPM filter's efficiency is based upon test data from the supplier's quality control program.

In selecting the appropriate CPM filter, testing contractors should avoid the mistake of equating the dioctyl phthalate size for the test particles to the pore size for the filter. Filters with pore sizes larger than the test particles can retain a high percentage of very small particles. In our evaluation of different types of filters, we determined that filter sizes of 47 mm are marginal, if not unacceptable, for use. Additionally, we believe that hydrophobic filters should be used to avoid absorption of water onto the CPM filter.

4. Water Specifications

Comment: Two commenters suggested that the final method specify the level of residue allowed for the water used to clean glassware and recovery samples, as was specified for acetone and methylene chloride. One commenter stated that the maximum percent residue by weight of the water should be specified to be consistent with the reagent specifications for acetone and methylene chloride. Three commenters noted that a residual mass level is not available for ASTM International D1193-06, Type I water.

Response: The purpose of the field reagent blanks is to provide a testing contractor with information to target corrective actions, if necessary, if they have difficulty in meeting the residual mass allowance in the method. The method does not require analysis of field reagent blank samples, and the field reagent blank values are not used in correcting CPM measurements. However, we acknowledge that Figure 3 could be misleading with regard to the field reagent blanks, and we have revised Figure 3 of the final method to remove the entries for the field reagents.

We acknowledge that the residue level is not specified for ASTM International D1193-06, Type I water, and we agree with the commenters that the method should specify a residual mass level for water used to prepare glassware and recover samples. Therefore, we have revised Sections 7.1.3 and 7.2.3 of the final method to specify that glassware preparation and sampling recovery must be conducted using deionized, ultra-filtered water that meets a residual blank value of 1 ppmw or less. We have also made accompanying changes to water specified in Sections 8.4, 8.5.3.2, and 11.2.2.1 of the final method. We believe that this performance specification will provide flexibility to testing contractors in obtaining deionized, ultra-filtered water (e.g., water could be purchased with a vendor

guarantee or the contractor could evaluate water they produce by evaporation and weighing of the residue).

5. Glassware Baking Requirements

Comment: Several commenters stated that the proposed requirement in Section 8.4 to bake glassware at 300°C for six hours was excessive. Several commenters stated that they had conducted experimental tests that showed that a lower baking temperature (e.g., 125°C for three hours) was sufficient to achieve the blank allowance specified in the method. One commenter stated that, based upon their experiments, no benefit was obtained from baking glassware. Another commenter stated that they had conducted numerous test runs on non-combustion sources without baking glassware and had achieved acceptable blank results. The commenter noted that there might be some emission sources where baking of glassware could be needed to meet the blank requirements, but the commenter stated that the mandatory baking requirements did not seem to be necessary for all sources. Another commenter stated that there is no laboratory data to determine if a lower temperature could be sufficient to achieve low background masses. Based upon experimental results, the commenter suggested allowing the use of baking of glassware at 125°C for three hours.

One commenter stated that, because the presence of silicone grease on impinger surfaces is highly unlikely due to the prevalence of O-rings, baking the glassware at 125°C for three hours after cleaning is adequate. The commenter added that the baking requirements should be revised because high-temperature baking would destroy or deteriorate the O-rings typically used to seal impinger components. The commenter stated that the effort to remove these O-rings before baking and then replace them after baking is time-consuming. Several commenters noted that the high-temperature baking requirements would be overly expensive (e.g., for large, high-temperature ovens) and time-consuming.

Another commenter stated that the requirement for glassware baking only prior to the test makes little sense. The commenter questioned why the glassware could not be rinsed with the recovery solvents as is done between runs. The commenter noted that the proposed method mandates a reagent blank and questioned why the reagent blank could not be changed to a proof blank with a limit.

One commenter stated that the requirement to bake glassware at 300°C for six hours should be optional because it has not been possible to fully evaluate the supporting data and the need for such high temperature is not readily

apparent for all situations. The commenter noted that the "Draft Project Report - Evaluation and Improvement of Condensable Particulate Measurement" may contain this information and recommended that the effect of pre-bake temperature and time on cleanliness of blanks be clearly presented in this report and include a table comparing the effect of 300°C for six hours versus lower glassware preparation temperatures. Otherwise, according to the commenter, this requirement would require the stack tester to bring to the testing site a large amount of pre-cleaned glassware, much more than what is currently normal for such testing.

One commenter suggested that testing contractors be allowed to meet the blank level specified in the method however they can. The commenter stated that the prescriptive temperature requirement, particularly in light of the fact that there are no data showing that the 2 mg blank cannot be achieved at lower temperatures or through other means, did not serve a purpose. Another commenter recommended that the tester start with baked glassware for the first test and then be allowed to perform additional tests reusing the same glassware after it has been cleaned by chemical methods. If the chemical cleaning of the glassware is not adequate, the commenter noted that blank

values would likely elevate, possibly eliminating the test from consideration. If the blanks do not elevate, the commenter stated that this scenario would be very cost-effective and would conserve resources.

Response: Method 202 has the potential to measure CPM at very low levels. Consequently, the glassware used in the sampling train must be free from contamination to maximize the precision and accuracy of the CPM measurements. The glassware cleaning requirements contained in the proposed revisions to Method 202 were based upon experimental results that indicated that the allowable blank correction of the method could not be achieved without thorough cleaning and baking of the glassware at 300°C for six hours.

Based upon our review of the public comments received regarding the baking requirements, we have determined that it is appropriate to provide a performance-based option in Section 8.4 for demonstrating the cleanliness of glassware used during the emission test. The option provides testing contractors with flexibility when preparing glassware while maintaining the cleanliness requirements of the method.

As an alternative to baking glassware, the final method allows testing contractors to perform a proof blank of the sampling train. Field train proof blanks are

recovered on-site from a clean, fully assembled sampling train prior to the first emissions test and provide the best indication of the lowest residual mass achievable by the tester. Field train recovery blanks are recovered from a sampling train after it has been used to collect emissions samples and has been rinsed in preparation for the second or third test in a series at a particular source. Use of field train recovery blanks allows the tester to account for and manage additional uncertainty that may be attributed to the tester's ability to clean the sampling train between test runs in the field.

6. Nitrogen Purge

Comment: Three commenters requested that the nitrogen purge procedures specified in Section 8.5 of the proposed method be revised to allow for the dry gas meter to be disconnected from the sampling train before the nitrogen purge is conducted. Two commenters stated that EPA should eliminate the portion of Figure 2 that shows the meter box and revise the text in the proposed Method 202 to require purging in a clean environment without the need for a meter box. Three commenters added that allowing the dry gas meter to be disconnected from the sampling train would decrease the delay between tests (i.e., the dry gas meter could be used with a new sampling train while the purge is

being conducted on the previous train). Three commenters also stated that requiring the dry gas meter to be connected to the sampling train during the purge will force testing contractors to bring extra equipment (e.g., sampling trains, dry gas meters) to the sampling site.

Three commenters suggested that the purge should be conducted at the sample recovery location (e.g., mobile laboratory) rather than at the actual sampling location (e.g., roof, stack sampling platform). Two commenters noted that it is not practical to haul nitrogen cylinders to the sampling location. One commenter suggested that, after the final leak check, the open ends of the impinger train could be capped during transport to the sample recovery area to reduce the possibility of oxygen contamination. The commenter noted that the sample would not be exposed to any more air than when immediately connecting to the nitrogen purge line.

Several commenters suggested that the proposed method be revised to allow testing contractors to conduct a positive-pressure purge instead of a negative-pressure purge using the dry gas meter. One commenter suggested that the purge gas flow rate be monitored by a rotameter instead of using the dry gas meter. The commenter noted that the flow rate is better regulated upstream of the

impingers rather than downstream by the dry gas meter and using the rotameter to regulate the purge gas flow rate would reduce the potential for pressurizing the sampling train. Another commenter expressed concerns that if the vacuum drawn by the dry gas meter does not match the pressure from the nitrogen tank, then the impingers could become over-pressurized which could compromise the integrity of the sampling train components.

One commenter recommended that the proposed testing protocol be modified to allow the tester to disassemble the impinger train to measure for moisture content prior to conducting the required nitrogen purge. One commenter noted that weighing the impingers prior to the nitrogen purge would provide a more accurate moisture catch determination and the need to measure the amount of degassed deionized water that is added (if any) would be eliminated. Three commenters added that, if the moisture content of the impingers is determined before the nitrogen purge, then testing contractors should be allowed to purge only the knock-out impinger, backup impinger, CPM filter, and first moisture trap impinger. One commenter stated that if the sampling train is purged by pushing nitrogen through the sampling train (i.e., positive pressure purge), then the sampling train components after the CPM filter

thermocouple could be disconnected from the train before beginning the purge. One commenter suggested that the purge be conducted through a Teflon[®] tube inserted through a stopper into the impinger arm and then into the liquid to avoid compounding errors associated with adding water to the first impinger (if needed). The commenter stated that this would alleviate the need to break the fitting or add water, and prevent the potentially compounding error of water addition. Another commenter requested that a Teflon[®] line be inserted down and through the short-stem impinger extending below the water level in the impinger catch. The commenter stated that this would reduce the potential for breaking glassware and contamination when removing/inserting glassware stems.

Three commenters suggested that the nitrogen purge requirements be revised to allow for any liquid collected in the first (drop-out) impinger to be transferred to the second (backup) impinger. The commenters noted that this approach would decrease the potential for contamination because a new piece of glassware (the long-stem impinger) would not be introduced into the sampling train. One commenter recommended that, after the liquid is transferred to the second impinger, the first impinger should be removed from the sampling train prior to the purge.

Response: It was our intent in the proposed Method 202 to allow testing contractors the option of conducting either a pressurized purge (i.e., without the dry gas meter box and pump attached to the sampling train) or a vacuum purge (i.e., with the dry gas meter box attached to the sampling train). However, we acknowledge that the language in Section 8.5.3 and the sampling train depicted in Figure 2 of the proposed method were unclear. Consequently, we have revised Section 8.5.3 and Figure 2 and added Figure 3 to the final method to clarify that a pressurized purge is an acceptable alternative.

With regard to the commenters' suggestion to allow testing contractors to conduct the nitrogen purge at the sample recovery location instead of at the sampling location, we continue to believe that testing contractors should have the flexibility to conduct the nitrogen purge at the location of their choosing; therefore, the final method does not specify where the purge must be conducted. However, testing contractors should conduct the purge as soon as practicable after the post-test leak check to reduce the potential for artifact formation in the impinger water.

With regard to the alternative sampling train configuration for the purge, we agree with the commenters

that testing contractors should be allowed the option of determining the amount of moisture collected prior to conducting the nitrogen purge, transferring any water collected prior to the CPM filter to the second impinger, and performing the nitrogen purge on the second impinger and the CPM filter only. Therefore, Section 8.5.3.2 of the final method contains an alternative purge procedure.

We disagree with the commenter's suggestion to insert a Teflon® tube into the first impinger for conducting the nitrogen purge. Using the configuration suggested by the commenters, there is no provision to maintain the temperature of the purge gas. Consequently, we believe that a Teflon® or other inert line used to purge the CPM train is not an acceptable alternative. Therefore, we are not revising Section 8.5.3.2 to allow the use of a Teflon® tube.

C. Conditional Test Method 039 (Dilution Method)

Comment: Several commenters urged EPA to continue the development of dilution-based test methods for measuring PM_{2.5}. One commenter supported EPA's work through the stakeholder process to decrease and eliminate other pollutant interferences that can affect the accurate measurement of emissions of fine particles, particularly for wet stacks and high volume/low concentration gas

streams. Another commenter encouraged EPA to use the stakeholder process, similar to that used for Methods 201A and 202, to move towards the promulgation of dilution methods and other test methods that can better measure emissions from high-temperature and high-moisture sources.

One commenter asserted that dilution methods more correctly simulate the atmospheric process leading to the formation and deposition of PM in the atmosphere. Another commenter expected that EPA's evaluation of an air dilution method would show that it is even more useful in accurately measuring direct PM_{2.5} filterable and condensable data for high temperature sources than the revised Methods 201A and 202.

Response: EPA continues to evaluate the precision and bias of PM_{2.5} collected using dilution methods. In addition to EPA's hardware design, several other hardware designs have been proposed that utilize dilution. While limited evaluations of EPA's hardware design have been performed, the other hardware designs proposed have more limited evaluations. The consensus standards body, ASTM International, has embarked on preparation of a standard method for dilution sampling of particulate material. We will continue to evaluate dilution method procedures and support the efforts of the ASTM International in their

development of a standard dilution-based test method for sampling PM. In addition to these development efforts, several other factors influence EPA's decision to delay proposing a dilution based sampling method. One factor is that there is no widely accepted dilution method available at this time. Another factor is that the available dilution sampling hardware configurations share few of the equipment used by any of the existing sampling methods. As a result, testing contractors would be required to invest in this new equipment. This capital investment would require a higher charge for testing than for the existing methods. In addition, since dilution sampling is somewhat more complex, contractors are likely to initially charge a premium for this more complex testing. Lastly, the availability of hardware and experienced individuals to perform dilution sampling is extremely limited. EPA recognizes that there are limited applications where dilution sampling provides advantages over the standard test methods. As a result, we encourage sources that encounter these situations to request that the regulatory authority that established the requirement to use this method to approve the use of dilution sampling as an alternative to the test method specified for determining compliance.

Comment: One commenter maintained that use of a test method to define what constitutes CPM for all sources is neither necessary, nor (in some cases) useful. For sources, like coal-fired boilers, where the only true condensable sulfate specie from coal combustion is sulfuric acid, the commenter stated that CPM could be better quantified by direct measurement using the Controlled Condensation Method (CCM). The commenter said that States should be allowed and, in the case of units with wet scrubbers, encouraged to use such direct measurements like CCM to quantify known CPM instead of using Method 202. According to the commenter, if the use of CCM is not allowed, Method 202 should include a procedure that allows sources to correct Method 202 results using results from simultaneous CCM test runs. In this procedure, according to the commenter, the source would be subtracting out essentially the same units of sulfate from Method 202 as would be added back in from the CCM results. If, on the other hand, sulfate artifacts do exist, the commenter said that the source would be subtracting "x" units of sulfate from Method 202 and adding back "y" units of sulfate from CCM to get an accurate measurement.

Response: While SO₃ may be the most abundant CPM emitted from coal fired combustion, there is indication

that other compounds comprise CPM. Few speciation tests of coal and oil combustion have been performed, but those that have indicate the presence of not only sulfate but also chloride, nitrate, ammonium ion, and a range of inorganic elements that are potentially components for CPM (including phosphorous, arsenic, and selenium). In addition, speciation tests have been able to identify components representing only about 60 percent of the mass. Therefore, the specific correction for sulfuric acid from coal combustion source emissions proposed by the commenter would add to the complexity of the method for all source categories while providing an advantage to only one specific source category.

EPA continues to review methods that involve controlled condensation for sulfuric acid. Because no standard method is available for controlled condensate measurement of sulfuric acid, we have determined that providing additional guidance or correction of Method 202 results is premature. EPA is following current efforts by ASTM International to develop a standard controlled condensate method for sulfuric acid. In the meantime, testers and facilities should petition their regulatory authority to approve alternative data treatment for specific sources.

VI. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

This action is not a "significant regulatory action" under the terms of Executive Order (EO) 12866 (58 FR 51735, October 4, 1993) and is, therefore, not subject to review under the EO.

B. Paperwork Reduction Act

This action does not impose an information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. Burden is defined at 5 CFR 1320.3(b). The final amendments do not contain any reporting or recordkeeping requirements. The final amendments revise two existing source test methods to allow one method to perform additional particle sizing at 2.5 μm and to improve the precision and accuracy of the other test method.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that 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 this rule on small entities, small entity is defined as: (1) a small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small 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 this final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This final rule will not directly impose any requirements on small entities. Most of the emission sources that will be required by State regulatory agencies (and federal regulators after 2011) to conduct tests using the revised methods are those that have PM emissions of 100 or more tons per year. EPA was unable to identify any small entities that would be required by State or federal regulatory agencies to use these test methods.

Although EPA was unable to identify any small entity that would be affected by this final action, EPA nonetheless recognizes the possibility that some entities may be required to use these test methods as a result of existing permits or regulations. To the extent small entities may be required to use this method, such a requirement would be mandated by a separate, independent regulatory action, not simply by EPA's promulgation of these final test methods. Moreover, we find that the cost to use the final test methods is comparable to the cost of the methods they replace. Accordingly, we do not expect there will be a significant economic impact to a substantial number of small entities upon promulgation of the final test methods. After January 1, 2011, when the transition period established in the Clean Air Fine Particle Implementation Rule expires, States are required to consider inclusion of pollutants measured by these test methods in new or revised regulations. The economic impacts caused by any new or revised State regulations for fine PM would be associated with those State rules and not with this final action to modify the existing test methods. Consequently, we believe that this final action imposes little if any adverse economic impact to small entities.

D. Unfunded Mandates Reform Act

This rule contains no federal mandates under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531-1538 for State, local, and tribal governments or the private sector. The incremental costs associated with conducting the revised test methods (expected to be less than \$1,000 per test) do not impose a significant burden on sources. Thus, this final action is not subject to the requirements of sections 202 and 205 of the UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. The low incremental cost associated with the revised test methods mitigates any significant or unique effects on small governments.

E. Executive Order 13132: Federalism

This action 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. In cases where a source of PM_{2.5} emissions is owned by a State or local government, those governments may incur minimal compliance

costs associated with conducting tests to quantify PM_{2.5} emissions using the revised methods when they are promulgated. However, such tests would be conducted at the discretion of the State or local government and the compliance costs are not expected to impose a significant burden on those governments. Additionally, the decision to review or modify existing operating permits to reflect the CPM measurement capabilities of the final test methods is at the discretion of State and local governments and any effects or costs arising from such actions are not required by this rule. Thus, Executive Order 13132 does not apply to this action.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). In cases where a source of PM_{2.5} emissions is owned by a tribal government, those governments may incur minimal compliance costs associated with conducting tests to quantify PM_{2.5} emissions using the revised methods when they are promulgated. However, such tests would be conducted at the discretion of the tribal government and the compliance costs are not expected to impose a

significant burden on those governments. Thus, Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

EPA interprets Executive Order 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the Executive Order has the potential to influence the regulation. This action is not subject to Executive Order 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211 (66 FR 28355, May 22, 2001) because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards 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 voluntary consensus standards bodies. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This action involves technical standards. EPA has decided to use two voluntary consensus standards that were identified at proposal to be applicable for use within the amended test methods. The first voluntary consensus standard cited in proposed Method 202 was ASTM International Method D2986-95a (1999), "Standard Method for Evaluation of Air, Assay Media by the Monodisperse DOP (Dioctyl Phthalate) Smoke Test," for its procedures to conduct filter efficiency tests. In the final Method 202, we replaced the prescriptive requirement to use a filter meeting ASTM International D2986-95a (1999) with a performance-based requirement limiting the residual mass contribution. The performance based approach specifies that the CPM filter must be a non-reactive, non-disintegrating filter that does not contribute more than 0.5 mg of residual mass to the CPM measurements. Regarding efficiency, the CPM filter must have an efficiency of at

least 99.95 percent (<0.05 percent penetration) on 0.3 µm particles.

The second voluntary consensus standard cited in proposed Method 202 was ASTM International D1193-06, "Standard Specification for Reagent Water," for the proper selection of distilled ultra-filtered water. In response to public comments, we applied a performance-based approach in the final Method 202 that requires deionized, ultra-filtered water that contains 1.0 ppmw (1 mg/L) residual mass or less.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, February 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. The final amendments revise existing test methods to improve the accuracies of the measurements that are expected to improve environmental quality and reduce health risks for areas that may be designated as nonattainment.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. Section 808 allows the issuing agency to make a rule effective sooner than otherwise provided by the CRA if the agency makes a good cause finding that notice and public procedure is impracticable, unnecessary or contrary to the public interest. This determination must be

supported by a brief statement. 5 U.S.C. 808(2). As stated previously, EPA has made such a good cause finding, including the reasons therefore, and established an effective date of January 1, 2011 (see section I.C, supra). EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the Federal Register. This action is not a "major rule" as defined by 5 U.S.C. 804(2).

**Methods for Measurement of Filterable PM₁₀ and PM_{2.5} and
Measurement of Condensable PM Emissions from Stationary Sources**

List of Subjects in 40 CFR Part 51

Administrative practice and procedure, Air pollution control, Carbon monoxide, Intergovernmental relations, Lead, Nitrogen oxide, Ozone, PM, Reporting and recordkeeping requirements, Sulfur compounds, Volatile organic compounds.

Dated:

Lisa P. Jackson,
Administrator.