

APPENDIX 19 STACK TESTING

PARTICULATE EMISSIONS TEST METHODS

40 CFR Part 60, Appendix A, contains the following test methods for particulates:

- Method 5, Particulate Emissions from Stationary Sources
- Method 5A, Particulate Emissions from the Asphalt Processing and Asphalt Roofing Industry
- Method 5B, Nonsulfuric Acid Emissions from Stationary Sources
- Method 5D, Particulate Emissions from Positive Pressure Bagfilters
- Method 5E, Particulate Emissions from the Wool Fiberglass Insulation Manufacturing Industry
- Method 5F, Nonsulfate Particulate Emissions from Stationary Sources
- Method 5G, Particulate Emissions from Wood Heaters from Dilution Tunnel Sampling Location
- Method 5H Particulate Emissions from Wood Heater from a Stack Location

40 CFR Part 51, Appendix M, contains the following test methods for particulates:

- Method 201 PM10 Emissions (Exhaust Gas Recycle Procedure)
- Method 201A PM10 Emissions (Constant Sampling Rate Procedure)
- Method 202 Condensable Particulate Emissions from Stationary Sources

The following issues should be considered when determining the appropriate test methods for particulate matter emissions:

1. For new source performance standards (NSPS) regulated facilities, the test method is specified in the applicable Subpart. For example, NSPS 40 CFR Part 60, Subpart AA,

Standards of Performance for Steel Plants, requires particulate emissions testing according to EPA Reference Method 5 for negative-pressure fabric filters and Method 5D for positive-pressure fabric filters.

2. To demonstrate compliance with particulate emissions limits in the North Carolina Administrative Code, the Division of Air Quality reserves the right to require that condensible particulate matter be quantified in conjunction with the filterable particulate matter. For these specific cases, the particulate emissions should be determined according to Reference Method 5, 201, or 201A and Method 202.
3. The regulatory bases for requiring the quantification and reporting of condensible particulate matter for certain sources and regulations are as follows:
 - a. 40 CFR Part 51, Method 201 and 201A state, "EPA recognizes that condensible emissions not collected by an in-stack method are also PM₁₀, and that emissions that contribute to ambient levels are the sum of condensible emissions and emissions measured by an in-stack PM₁₀ method" and "EPA suggests that source PM₁₀ measurement include both in-stack PM₁₀ and condensible emissions."
 - b. **15A NCAC 2D .0501**, Compliance with Emissions Control Standards, acknowledges that "a number of sources are known to emit organic material (oil, pitch, plasticizers, etc.) which exist as finely divided liquid droplets at ambient conditions. These materials cannot be satisfactorily collected by means of the above Method 5."

In summary, whether to require quantification of condensible particulate matter should be made on a case-by-case basis. The factors for determining whether to include condensible particulate matter are the type of emission source and any applicable regulations.*

SULFUR DIOXIDE TEST METHODS

*Michael Y. Aldridge to Regional Supervisors and Laura Butler, .Guidelines for Particulate Matter Emissions Determinations., 6 June 1996(memorandum).

Fuel Analysis

That part of **15A NCAC 2D .0501(c)(4)** that specifies the time intervals over which to take fuel samples applies only when fuel samples are taken and analyzed to demonstrate compliance with ambient air quality standards for sulfur dioxide (**15A NCAC 2D .0402**). It does not apply when fuel samples are taken and analyzed to demonstrate compliance with the emission standard for sulfur dioxide (**15A NCAC 2D .0516**).*

NITROGEN AND NITROGEN OXIDES

ASTM Test Method D4629, “Standard Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection” is acceptable for determining nitrogen content in No. 2 fuel oil.†

PARTICULATE COMPLIANCE DETERMINATION USING SOURCE TESTING

When source testing is used to show compliance for particulate emissions, compliance determinations are made based on filterable particulate only with these two exceptions:

1. In cases where sources are known to emit organic material (oil, pitch, plasticizers, etc.) that exist as finely divided liquid droplets at ambient conditions, compliance determination is made using Method 5 and Method 202.
2. When the Division of Air Quality finds that it is necessary to require controls or impose permit restrictions on both filterable particulate matter, as measured by Method 5, and condensible particulate matter (organic and inorganic), as measured by Method 202, to prevent an exceedance of the ambient air quality standards of **15A NCAC 2D .0400**, compliance determination is made using Method 5 and

*N. O. Gerald to W. L. Boyer, 21 Apr. 1988 (letter).

†Michael Y. Aldridge to Sally Nara, “Clarification of March 30, 2001 “Guidance for Analysis Procedure For Nitrogen in No. 2 Fuel Oil, Subpart GG,” 19 April 2001 (memorandum).

Method 202. For these situations, condensible particulate matter is not only measured, but it is also used to determine compliance with permit restrictions placed on condensible particulate.*

Any source covered under New Source Performance Standards that is known to emit organic material is also subject to the SIP particulate standard for that source category, and compliance with that standard should be determined based on total particulate (filterable and condensible).†

METHOD 9 VISIBLE EMISSIONS

Reading Multiple Points

A proper Method 9 reading cannot be conducted on multiple emission points if there are any visible emissions from any of the points during the observation period. It is not acceptable to conduct a visible emissions evaluation for more than one emission point within any 15-second period.‡

However, under certain conditions, a single reader may read up to three points at the same time using Method 9 for compliance with 40 CFR Part 60, Subparts LL and OOO. These conditions are:

1. No more than three emission points are read concurrently.
2. All three emission points are within a 70° viewing sector or angle in front of the observer such that the proper sun position can be maintained for all three points.
3. If an opacity reading for any one of the three emission points is within 5 percent opacity of the applicable standard, then the observer must stop taking readings for the other two points and continue reading just that single point.¶

*Alan Klimek to Section Chiefs and Regional Supervisors, "NC DAQ Procedures to Quantify Condensible Particulate Matter," 4 May 2001 (memorandum).

†*Ibid.*

‡David Hoewkamp to Susana Perez, "Method 9 at Multiple Points," 5 May 1998 (memorandum).

¶J. David Mobley to Addressees, "Alternative Testing Procedures for Application of Method 9 to Multiple Emission Points under 40 CFR 60, Subpart LL and OOO," 22 Apr. 1999 (memorandum).

**DETERMINATION OF
CONTROL SYSTEM EFFICIENCY:
15A NCAC 2D .0914**

15A NCAC 2D .0914 requires that the efficiency of a capture system used to transport volatile organic compound emissions be determined using accepted engineering practices and in a manner approved by the Director. The Director has approved the methods contained in 55 FR 26814, June 29, 1990, pages 26887 to 26909 (Appendix B of 40 CFR 52.741) as being accepted engineering practices. Any deviations from these methods must be acceptable to the Division of Air Quality. Except for minor changes in methodology that do not have the potential to change the results, all deviations from these methods should be approved by the Environmental Protection Agency.