

SUBCHAPTER 02D - AIR POLLUTION CONTROL REQUIREMENTS

SECTION .2600 SOURCE TESTING

.2601 PURPOSE AND SCOPE

- (a) The purpose of this Section is to assure consistent application of testing methods and methodologies to demonstrate compliance with emission standards.
- (b) This Section shall apply to all air pollution sources.
- (c) Emission compliance testing shall be by the procedures of this Section, except as may be otherwise required in Rules .0524, .0912, .1110, .1111, or .1415 of this Subchapter.
- (d) The Director may approve using test methods other than those specified in this Section under Paragraph (i) of Rule .2602 of this Section.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5);
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15A NCAC 02D .2602 GENERAL PROVISIONS ON TEST METHODS AND PROCEDURES

- (a) The owner or operator of a source shall perform any required test at his own expense.
- (b) The final test report shall describe the training and air testing experience of the person directing the air test.
- (c) Air emission testing protocols shall be provided to the Director prior to air pollution testing, but are not required to be pre-approved by the Director prior to air pollution testing. The Director will review air emission testing protocols for pre-approval prior to testing if requested by the owner or operator at least 45 days before conducting the test.
- (d) Any person proposing to conduct an emissions test to demonstrate compliance with an applicable standard shall notify the Director at least 15 days before beginning the test so that the Director may at his option observe the test.
- (e) For compliance determination, the owner and operator of the source shall provide:
 - (1) sampling ports, pipes, lines, or appurtenances for the collection of samples and data required by the test procedure;
 - (2) scaffolding and safe access to the sample and data collection locations; and
 - (3) light, electricity, and other utilities required for sample and data collection.
- (f) Unless otherwise specified in the applicable permit or during the course of the protocol review, the results of the tests shall be expressed in the same units as the emission limits given in the rule for which compliance is being determined.
- (g) The owner or operator of the source shall arrange for controlling and measuring the production rates during the period of air testing. The owner or operator of the source shall be responsible for ensuring that the equipment or process being tested is operated at the production rate that best fulfills the purpose of the test. The individual conducting the emission test shall describe the procedures used to obtain accurate process data and shall be responsible for including in the test report the average production rates determined during each testing period.
- (h) The final air emission test report shall be submitted to the Director not later than 30 days after sample collection. The owner or operator may request an extension to submit the final test report. The Director shall approve an extension if he finds that the extension request is technically justified.
- (i) The Director shall make the final determination regarding any testing procedure deviation and the validity of the compliance test.
 - (1) The Director may allow deviations from a method specified under a rule in this Section if the owner or operator of the source being tested demonstrates to the satisfaction of the Director that the specified method is inappropriate for the source being tested.
 - (2) The Director may prescribe alternate test procedures on an individual basis when he finds that the alternative method is necessary to secure more reliable test data.
 - (3) For sources or pollutants for which no test method is specified in this Section, the Director may prescribe or approve methods on an individual basis.
- (j) The Director may authorize the Division of Air Quality to conduct independent tests of any source subject to a rule in this Subchapter to determine the compliance status of that source or to verify any test data submitted relating to that source. Any test conducted by the Division of Air Quality using the appropriate testing procedures described in this Section shall have precedence over all other tests.

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.2603 TESTING PROTOCOL

(a) Testing protocols shall include:

- (1) the facility and testing company contact information, including a mailing address, email, and phone number;
- (2) the permit number and revision including permitted source name and ID number;
- (3) an introduction explaining the purpose of the proposed test, including identifying the regulations and permit requirements for which compliance is being demonstrated and the allowable emission limits;
- (4) a detailed description of the facility and the source to be tested;
- (5) a detailed description of the test procedures, including equipment, analytical procedures, sampling locations, reporting and data reduction requirements, and internal quality assurance and quality control activities;
- (6) source testing audit requirements applicable to the proposed test methods;
- (7) all modifications made to the test methods referenced in the protocol;
- (8) the permitted maximum process rate, maximum normal operation process rate, and the proposed target process rate during testing;
- (9) a description of how production or process data will be documented during testing; and
- (10) the proposes test schedule.

(b) The tester shall not deviate from the protocol or test plan unless the owner or operator documents the deviation in the test report.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5); Eff. . March 13, 2008;

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.2604 NUMBER OF TEST POINTS

(a) Method 1 of Appendix A to 40 CFR Part 60 shall be used to select a suitable site and the appropriate number of test points for the following situations:

- (1) particulate testing;
- (2) volatile organic compounds;
- (3) velocity and volume flow rate measurements;
- (4) testing for acid mist or other pollutants that occurring in liquid droplet form;
- (5) sampling for which velocity and volume flow rate measurements are necessary for computing final test results; or
- (6) isokinetic sampling.

(b) Method 1 of Appendix A of 40 CFR Part 60 shall be used as written with the following clarifications:

- (1) Testing installations with multiple ducts can be accomplished by testing the discharge stack(s) to which the ducts exhaust. If the multiple ducts are individually tested, then Method 1 shall be applied to each duct individually.
- (2) If test ports in a duct are less than two diameters downstream or less than one-half diameter upstream from any disturbance disturbance, such as fan, elbow, change in diameter, or other physical feature disturbing the gas flow,, the acceptability of the test location shall be determined by the Director before the test and after his review of technical and economic factors.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5); Eff. March 13, 2008;

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.2605 VELOCITY AND VOLUME FLOW RATE

Method 2 of Appendix A of 40 CFR Part 60 shall be applied as written and used concurrently with any test method requiring velocity and volume flow measurements.

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.2606 MOLECULAR WEIGHT

(a) Except as allowed by Paragraphs (b) of this Rule, Method 3 of Appendix A to 40 CFR Part 60 shall be applied as written and used concurrently with any test method if necessary to determine the molecular weight of the gas being sampled by determining the fraction of carbon dioxide, oxygen, carbon monoxide, and nitrogen.

(b) The grab sample technique may be substituted using instruments such as Bacharach Fyrite™, with the following restrictions:

(1) Instruments such as the Bacharach Fyrite™ shall only be used for the measurement of carbon dioxide.

(2) Gas samples shall be taken during the emission test run to account for variations in the carbon dioxide concentration. At least four samples shall be taken during a one-hour test run.

(3) The total concentration of gases other than carbon dioxide, oxygen, and nitrogen shall be less than one percent.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5); Eff. March 13, 2008;

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.2607 DETERMINATION OF MOISTURE CONTENT

Method 4 of Appendix A to 40 CFR Part 60 shall be applied as written and used concurrently with any test method requiring determination of gas moisture content.

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.2608 NUMBER OF RUNS AND COMPLIANCE DETERMINATION

Each test, excluding fuel sample tests, shall consist of three consecutive runs of the applicable test method at the same operating condition. If other operating conditions or scenarios are to be tested, then three consecutive runs shall be performed for each of these operating conditions or scenarios. For determining compliance with an applicable emission standard, the average of the results of all repetitions shall apply. On a case-by-case basis, compliance may be determined using the arithmetic average of two run results if the Director determines that an unavoidable and unforeseeable event happened beyond the owner's, operator's, or tester's control and that a third run could be not be completed.

*History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5);
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.2609 PARTICULATE TESTING METHODS 1

(a) With the exception allowed under Paragraph (b) of this Rule, Method 5 of Appendix A of 40 CFR Part 60 and Method 202 of Appendix M of 40 CFR Part 51 shall be used to demonstrate compliance with particulate emission standards. The owner or operator may request an exemption from using Method 202 and the Director shall approve the exemption if the Director determines that the demonstration compliance with an applicable emission standard is unlikely to change with or without the Method 202 results included.

(b) Method 17 of Appendix A of 40 CFR Part 60 may be used instead of Method 5 if:

(1) The stack gas temperature does not exceed 320° F,

(2) Particulate matter concentrations are known to be independent of temperature over the normal range of temperatures characteristic of emissions from a specified source category, and

(3) The stack does not contain liquid droplets or is not saturated with water vapor.

(c) Particulate testing on steam generators that use soot blowing as a routine means for cleaning heat transfer surfaces shall be conducted so that the contribution of the soot blowing is represented as follows:

(1) If the soot blowing periods are expected to represent less than 50 percent of the total particulate emissions, only one of the test runs shall include a soot blowing cycle.

(2) If the soot blowing periods are expected to represent more than 50 percent of the total particulate emissions then two of the test runs shall each include a soot blowing cycle. Under no circumstances shall all three test runs include soot blowing. The average emission rate of particulate matter is calculated by the equation:

$$EAVG = S(ES)\{(A+B)/AR\} + EN\{((R-S)/R) - (BS/AR)\} 20$$

where:

(A) EAVG equals the average emission rate in pounds per million Btu for daily operating time.

(B) ES equals the average emission rate in pounds per million Btu of sample(s) containing soot blowing.

(C) EN equals the average emission rate in pounds per million Btu of sample(s) with no soot blowing.

(D) A equals hours of soot blowing during sample(s).

(E) B equals hours without soot blowing during sample(s) containing soot blowing.

(F) R equals average hours of operation per 24 hours.

(G) S equals average hours of soot blowing per 24 hours.

The Director may approve an alternate method of prorating the emission rate during soot blowing if the owner or operator of the source demonstrates that changes in boiler load or stack flow occur during soot blowing that are not representative of normal soot blowing operations.

(d) Unless otherwise specified by an applicable rule or federal subpart, the minimum time per test point for particulate testing shall be two minutes, and the minimum time per test run shall be one hour.

(e) Unless otherwise specified by an applicable rule or federal subpart, the sample gas drawn during each test run shall be at least 30 cubic feet.

(f) Method 201 or Method 201A in combination with Method 202 of Appendix M of 40 CFR Part 51 shall be used to determine compliance with PM10 emission standards. If the exhaust gas contains entrained moisture droplets, Method 5 of Appendix A of 40 CFR Part 60 in combination with Method 202 of Appendix M of 40 CFR Part 51 shall be used to determine PM10 emission compliance.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5); 6 Eff. June 1, 2008.

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02D .2610 OPACITY

(a) Method 9 of Appendix A to 40 CFR Part 60 shall be used to show compliance with opacity standards if opacity is determined by visual observation.

(b) Method 22 of Appendix A to 40 CFR Part 60 shall be used to determine compliance with opacity standards if these standards are based upon the frequency of fugitive emissions that are visible during the observation period specified in the applicable rule or by permit condition.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5); Eff. June 1, 2008; Readopted Eff. November 1, 2019.

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02D .2611 SULFUR DIOXIDE TESTING METHODS

(a) If compliance is to be demonstrated for a combustion source through stack sampling the procedures described in Method 6 or Method 6C of Appendix A of 40 CFR Part 60 shall be used. When Method 6 of Appendix A of 40 CFR Part 60 is used to determine compliance, compliance shall be determined by averaging six 20-minute samples taken over such a period of time that no more than 20 minutes elapses between any two consecutive samples. The 20-minute run requirement only applies to Method 6 not to Method 6C. Method 6C is an instrumental method and the sampling is done continuously.

(b) Fuel burning sources not required to use continuous emissions monitoring to demonstrate compliance with sulfur dioxide emission standards, may determine compliance with sulfur dioxide emission standards by stack sampling or by analyzing sulfur content of the fuel.

(c) For stationary gas turbines, Method 20 of 40 CFR Part 60 shall be used to demonstrate compliance with applicable sulfur dioxide emissions standards.

(d) When compliance is to be demonstrated for a combustion source by analysis of sulfur in fuel, sampling, preparation, and analysis of fuels shall be according to the following American Society of Testing and Materials (ASTM) methods. The Director may approve ASTM methods different from those described in this Paragraph if they will provide equivalent or more reliable results. The Director may prescribe alternate ASTM methods on an individual basis if that action is necessary to secure reliable test data.

(1) Coal Sampling:

(A) Sampling Location. Coal shall be collected from a location in the handling or processing system that provides a sample representative of the fuel bunkered or burned during a boiler operating day. For the purpose of this method, a fuel lot size is defined as the weight of coal bunkered or consumed during each boiler-operating day. For reporting and calculation purposes, the gross sample shall be identified with the calendar day on which sampling began. The Director may approve alternate definitions of fuel lot sizes if the alternative will provide a more representative sample.

(B) Sample Increment Collection. A coal sampling procedure shall be used that meets the requirements of ASTM D 2234 Type I, condition A, B, and C, and systematic spacing for collection of sample increments. All requirements and restrictions regarding increment distribution and sampling device constraints shall be observed.

(C) Gross Samples. ASTM D 2234, 7.1.2, Table 2 shall be used except as provided in 7.1.5.2 to determine the number and weight of increments (composite or gross samples).

(D) Preparation. ASTM D 2013 shall be used for sample preparation from a composite or gross sample.

(E) Gross Caloric Value (GCV). ASTM D 2015 or D 3286 shall be used to determine GCV on a dry basis from a composite or gross sample.

(F) Moisture Content. ASTM D 3173 shall be used to determine moisture from a composite or gross sample.

(G) Sulfur Content. ASTM D 1 3177 or D 4239 shall be used to determine the percent sulfur on a dry basis from a composite or gross sample.

(2) Oil Sampling

(A) Sample Collection. A sample shall be collected at the pipeline inlet to the fuel-burning unit after sufficient fuel has been drained from the line to remove all fuel that may have been standing in the line.

(B) Heat Of Combustion. ASTM Method D 240 or D 2015 shall be used to determine the heat of combustion.

(C) Sulfur Content. ASTM Method D 129 or D 1552 shall be used to determine the sulfur content.

The sulfur content and BTU content of the fuel shall be reported on a dry basis. When the test methods described in Subparagraph (d)(1) or (d)(2) of this Rule are used to demonstrate that the ambient air quality standards for sulfur dioxide are being protected, the sulfur content shall be determined at least once per year from a composite of at least three or 24 samples taken at equal time intervals from the fuel being burned over a three-hour or 24-hour period, respectively, whichever is the time period for which the ambient standard is most likely to be exceeded; this requirement shall not apply to sources that are only using fuel analysis in place of continuous monitoring to meet the requirements of Section .0600 of this Subchapter.

(e) When compliance is shown for sulfuric acid manufacturing plants or spodumene ore roasting plants with Rules .0517 and .0527, respectively, of this Section through stack sampling, the procedures described in Method 8 of Appendix A of 40 CFR Part 60 shall be used. When Method 8 of Appendix A of 40 CFR Part 60 is used to determine compliance, compliance shall be determined by averaging emissions measured by three one-hour test runs unless otherwise specified in the applicable rule or federal subpart.

(f) When compliance is shown for a combustion source emitting sulfur dioxide not covered under Paragraph (a) through (e) of this Rule through stack sampling, the procedures described in Method 6 or Method 6C of Appendix A of 40 CFR Part 60 shall be used. When using Method 6 procedures to show compliance, compliance shall be determined by averaging six 20-minute samples taken over such a period of time that no more than 20 minutes elapses between any two consecutive samples. The 20-minute run requirement only applies to Method 6 not to Method 6C. Method 6C is an instrumental method and the sampling is done continuously.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5); Eff. June 1, 2008.

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.2612 NITROGEN OXIDE TESTING METHODS

(a) Combustion sources not required to use continuous emissions monitoring to demonstrate compliance with nitrogen oxide emission standards shall demonstrate compliance with nitrogen oxide emission standards using Method 7 or Method 7E of Appendix A to 40 CFR Part 60.

(b) Method 20 of Appendix A to 40 CFR Part 60 shall be used to demonstrate compliance with nitrogen oxide emissions standards for stationary gas turbines.

History Note: Authority G.S. 143-215.3(a)(1); 143-215.65; 143-215.66; 143-215.107(a)(5); Eff. March 13, 2008;

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.2613 VOLATILE ORGANIC COMPOUND TESTING METHODS

- (a) For surface coating material, such as paint, varnish, stain, and lacquer, the volatile matter content, water content, density, volume of solids, and weight of solids shall be determined by Method 24 of Appendix A to 40 CFR Part 60.
- (b) For printing inks and related coatings, the volatile matter and density shall be determined by Method 24A of Appendix A to 40 CFR Part 60.
- (c) For solvent metal cleaning equipment as defined in 15A NCAC 02D .0930, the following procedure shall be followed to perform a material balance test:
- (1) clean the degreaser sump before testing;
 - (2) record the amount of solvent added to the tank with a flow meter;
 - (3) record the weight and type of workload degreased each day;
 - (4) at the end of the test run, pump out the used solvent and measure the amount with a flow meter. In addition, estimate the volume of metal chips and other material remaining in the emptied sump;
 - (5) bottle a sample of the used solvent and analyze it to find the percent that is oil and other contaminants. The oil and solvent proportions can be estimated by weighing samples of used solvent before and after boiling off the solvent; and
 - (6) compute the volume of oils in the used solvent. The volume of solvent displaced by this oil plus the volume of makeup solvent added during operations equals to the solvent emissions.
- (d) For bulk gasoline terminals as defined in 15A NCAC 02D .0927, emissions of volatile organic compounds shall be determined by the procedures in 40 CFR 60.503.
- (e) For organic process equipment, leaks of volatile organic compounds shall be determined by Method 21 of Appendix A of 40 CFR Part 60. Organic process equipment shall include valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, access door seals, and agitator seals.
- (f) For determination of solvent in filter waste, such as muck and distillation waste, in accordance with 15A NCAC 02D .0912, derive the quantity of volatile organic compounds per quantity of discarded filter muck. The procedure to be used in making this determination shall be the test method "Standard Method of Test for Dilution of Gasoline-Engine Crankcase Oils," ASTM 322 except the filter muck is to be used instead of crankcase oil.
- (g) For sources of volatile organic compounds not covered under the methods specified in Paragraphs (b) through (e) of this Rule, one of the applicable test methods in Appendix M to 40 CFR Part 51 or Appendix A to 40 CFR Part 60 shall be used to determine compliance with volatile organic compound emission standards.
- (h) Compounds excluded from the definition of volatile organic compound in 15A NCAC 02D .0901 shall be treated as water.

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.2614 DETERMINATION OF VOC EMISSION CONTROL SYSTEM EFFICIENCY

- (a) This Rule shall apply to any test method used to determine the capture or control efficiency of any device or system designed, installed, and operated for the purpose of reducing volatile organic compound emissions.
- (b) The control efficiency of volatile organic compound emission control systems shall be determined using the following procedures:
- (1) The volatile organic compound containing material shall be sampled and analyzed using the procedures set forth in this Section.
 - (2) Samples of the gas stream containing volatile organic compounds shall be taken simultaneously at the inlet and outlet of the emissions control device.
 - (3) The efficiency of the control device shall be expressed as a percent of the total combustible carbon content reduction achieved.
- (c) The volatile organic compound mass emission rate shall be the sum of emissions from the control device and the emissions not collected by the capture system.
- (d) Capture efficiency shall be determined using the EPA recommended capture efficiency protocols and test methods as described in the EPA document, EMTIC GD-035, "Guidelines for Determining Capture Efficiency." This document is hereby incorporated by reference including subsequent amendments or editions. A copy of the referenced materials may be obtained free of charge via the Internet from the EPA TTN website at <http://www3.epa.gov/ttn/emc/guidlnd/gd-036.pdf>.

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.2615 DETERMINATION OF LEAK TIGHTNESS AND VAPOR LEAKS

(a) Leak Detection Procedures. One of the following test methods from the EPA document "Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection System," EPA-450/2-78-051, published by the U.S. Environmental Protection Agency, December 1978, shall be used to determine compliance with 15A NCAC 02D .0932, Gasoline Cargo Tanks And Vapor Collector Systems:

(1) The gasoline vapor leak detection procedure by combustible gas detector described in Appendix B to EPA-450/2-78-051 shall be used to determine leakage from gasoline cargo tanks and vapor control systems.

(2) The leak detection procedure for bottom-loaded cargo tanks by bag capture method described in Appendix C to EPA-450/2-78-051 shall be used to determine the leak tightness of cargo tanks during bottom loading.

(b) Annual Testing. The pressure-vacuum test procedures for leak tightness of cargo tanks described in Method 27 to Appendix A of 40 CFR Part 60 or 49 CFR 180.407 shall be used to determine the leak tightness of gasoline cargo tanks in use and equipped with vapor collection equipment. Method 27 of Appendix A of 40 CFR Part 60 is changed for fugitive emissions leak prevention to read:

(1) 8.2.1.2 "Connect static electrical ground connections to tank."

(2) 8.2.1.3 "Attach test coupling to vapor return line."

(3) 16.0 No alternative procedure is applicable.

(c) Copies of Appendix B and C of the EPA document, "Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection System," EPA-450/2-78-051, cited in this Rule, are hereby incorporated by reference and are available on the Division's website at <http://deq.nc.gov/about/divisions/air-quality/air-quality-enforcement/emission-measurement>.

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02D .2617 TOTAL REDUCED SULFUR

(a) Method 16 of Appendix A of 40 CFR Part 60 or Method 16A of Appendix A of 40 CFR Part 60 shall be used to show compliance with total reduced sulfur emission standards.

(b) Method 15 of Appendix A of 40 CFR Part 60 may be used as an alternative method to determine total reduced sulfur emissions from tail gas control units of sulfur recovery plants, hydrogen sulfide in fuel gas for fuel gas combustion devices, and where specified in other applicable federal subparts.

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.2621 DETERMINATION OF FUEL HEAT CONTENT USING F-FACTOR

- (a) Emission rates for wood or fuel burning sources that are expressed in units of pounds per million BTU shall be determined by the "Oxygen Based F Factor Procedure" described in Section 5 of Method 19 of Appendix A of 40 CFR Part 60. Other procedures described in Method 19 may be used if appropriate. To provide data of sufficient accuracy for use with the F-factor methods, an integrated (bag) sample shall be taken for the duration of each test run. For simultaneous testing of multiple ducts, there shall be a separate bag sample for each sampling train. The bag sample shall be analyzed with an Orsat analyzer by Method 3 of Appendix A of 40 CFR Part 60. (The number of analyses and the tolerance between analyses are specified in Method 3.) The specifications stated in Method 3 for the construction and operation of the bag sampling apparatus shall be followed.
- (b) A continuous oxygen (O₂) and carbon dioxide (CO₂) monitor under Method 3E of Appendix A of 40 CFR Part 60 may be used if the average of all values during the run are used to compute the average concentrations.
- (c) The Director may approve the use of alternative methods according to Rule .2602 of this Section if they meet the requirements of Method 3 of Appendix A of 40 CFR Part 60 .

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