Chapter 139 -- Sampling and Testing

Subchapter A. Sampling and Testing Methods and Procedures

STATIONARY SOURCES

§139.11. General requirements.

The following are applicable to source tests for determining emissions from stationary sources:

(1) Performance tests shall be conducted while the source is operating at maximum routine operating conditions or under such other conditions, within the capacity of the equipment, as may be requested by the Department.

(2) The Department will consider for approval where sufficient information is provided to verify the source conditions existing at the time of the test and where adequate data is available to show the manner in which the test was conducted. Information submitted to the Department shall include, as a minimum all of the following:

(i) A thorough source description, including a description of any air cleaning devices and the flue.

(ii) Process conditions, for example, the charging rate of raw material or rate of production of final product, boiler pressure, oven temperature, and other conditions which may affect emissions from the process.

(iii) The location of the sampling ports.

(iv) Effluent characteristics, including velocity, temperature, moisture content, gas density (percentage CO, CO2, O2 and NO2), static and barometric pressures.

(v) Sample collection techniques employed, including procedures used, equipment descriptions and data to verify that isokinetic sampling for particulate matter collection occurred and that acceptable test conditions were met.

(vi) Laboratory procedures and results.

(vii) Calculated results.

§139.12. Emissions of particulate matter.

(a) Tests for determining emissions of filterable particulate matter from stationary sources to demonstrate compliance with the particulate matter emission standards in § § 123.11—123.13 (relating to combustion units; incinerators; and processes) shall conform with the following:

(1) Test methods for particulate matter emissions shall include dry filters and provide for at least a 95% collection efficiency of particulate matter.

(2) Isokinetic sampling procedures shall be used in sampling for particulate matter emissions and the weight determined gravimetrically after the removal of uncombined water.

(3) Test methods and procedures shall be equivalent to those specified in § 139.4(5) (relating to references). The equipment shall be inert where appropriate and similar to that specified in § 139.4(1).

(4) The minimum sampling time shall be 1 hour or as specified in an applicable standard or by the Department and the minimum sample volume shall be 50 cubic feet or as specified in an applicable standard or by the Department, corrected to standard conditions (dry basis).

(5) Results shall be calculated based upon sample train component weights specified in § 139.4(5). Results shall be reported as pounds of particulate matter per hour and in accordance with the units specified in § § 123.11—123.13.

(b) The owner or operator of a stationary source subject to emission limitations for PM-10 and $PM_{2.5}$ or to applicability determinations required under Chapter 127, Subchapters D and E (relating to prevention of significant deterioration of air quality; and new source review) shall demonstrate compliance for filterable and condensable PM-10 and $PM_{2.5}$ emissions.

(c) Compliance with a particulate matter, PM-10 or $PM_{2.5}$ emission limitation issued by the Department prior to January 1, 2011, will not be based on condensable particulate matter unless required under the terms and conditions of a plan approval, operating permit or the State Implementation Plan codified in 40 CFR 52.2020 (relating to identification of plan).

(d) A compliance demonstration required under subsection (b) or (c) must include the measurement and reporting of filterable and condensable particulate matter. Test methods and procedures used to determine compliance must be equivalent to those specified in § 139.4(5). An owner or operator must obtain the Department's prior written approval for the use of methods and procedures that are not prescribed in the Source Testing Manual.

(e) The Source Test Manual referenced in § 139.4(5) is subject to revision in accordance with the procedures in § 139.5 (relating to revisions to the source testing manual and continuous source monitoring manual).

§139.13. Emissions of SO, HS, TRS and NO.

The following are applicable to tests for determining emissions of SO, HS, TRS and NO from

stationary sources:

(1) Test methods and procedures for sulfur oxides shall be equivalent to or modified to produce

results equivalent to those which would be obtained by employing the procedures specified in

§ 139.4(5) (relating to references). Test methods and procedures for SO from combustion sources shall be equivalent to or modified to produce results equivalent to those which would be obtained by employing procedures specified in § 139.4(5). Details for sampling equipment are contained in § 139.4(1) or (5).

(2)– (4) **[Not in SIP]**

(5) Test methods and procedures and equipment for NO shall be similar to those specified in § 139.4(1) and (5).

(6) For determining emissions of SO2 and H2S, the minimum sampling time shall be 1 hour and the minimum sample volume shall be 30 cubic feet corrected to standard conditions--dry basis.

§139.14. Emissions of VOCs.

(a) The following are applicable to tests for determining volatile organic content:

(1) Test methods and procedures for the total volatiles content, solids content, exempt solvent content, water content and density of surface coatings shall be equivalent to those specified in § 139.4(1) and (5) (relating to references).

(2) Test methods and procedures for VOCs in effluent water shall be equivalent to those specified in § 139.4(16), expressed as pentane.

(3) For determining the solvent content of wastes in dry cleaning facilities, test methods and procedures shall be equivalent to those specified in § 139.4(17).

(4) Results shall be reported in accordance with the units specified in the appropriate section of Chapter 129 (relating to standards for sources).

(b) The following are applicable to tests for determining the emissions of VOCs:

(1) Test methods for VOC emissions shall use a technique having at least a 95% collection efficiency for VOCs.

(2) Except for those sources or systems specified in this subsection, the test methods and procedures and equipment for VOCs, excluding carbon dioxide, carbon monoxide and methane shall be equivalent to those specified in EPA Method 25 or as specified in § 139.4(5). The owner or operator of a source may exclude ethane from the VOC measurement. If ethane is excluded, the measurement of ethane shall be reported separately.

(3) For gasoline vapor recovery systems, test methods and procedures and equipment for VOCs shall be equivalent to those specified in EPA Method 25B or as specified in §139.4(5).

(4) For determining the magnitude of VOC leaks from petroleum refinery equipment, from synthetic organic chemical and polymer manufacturing equipment and from surface active agent manufacturing equipment, test methods and procedures shall be equivalent to those specified in EPA Method 21 or as specified in § 139.4(5). The owner or operator of a source may exclude methane and ethane from this measurement. If methane and ethane are excluded, the measurement of methane and ethane together shall be reported.

(5) For determining the VOC leak tightness of truck tanks, test methods and procedures shall be equivalent to those specified in EPA Method 27 or as specified in § 139.4(5).

(6) For determining the magnitude of VOC leaks from gasoline tank trucks and vapor collection systems, test methods and procedures shall be equivalent to those specified in EPA Method 21 or as specified in § 139.4(5).

(7) Results shall be reported in accordance with the units specified in the appropriate section of Chapter 129.

§139.15. [Not in SIP]

§139.16. Sulfur in fuel oil.

The following are applicable to tests for the analysis of commercial fuel oil:

(1) The fuel oil sample for chemical analysis shall be collected in a manner that provides a representative sample. Upon the request of a Department official, the person responsible for the operation of the source shall collect the sample employing the procedures and equipment specified in §139.4(10) (relating to references).

(2) Test methods and procedures for the determination of viscosity shall be that specified in §139.4(11) (relating to references). The viscosity shall be determined at 100° F.

(3) Tests methods and procedures for the determination of sulfur shall be those specified in §139.4(12)--(15).

(4) Results shall be reported in accordance with the units specified in §123.22 (relating to combustion units).

§139.17. General requirements.

The following are applicable to source tests for determining alternative opacity limitations pursuant to §123.45 (relating to alternative opacity limitations).

(1) A series of three consecutive performance tests shall be conducted in accordance with the requirements of §§139.1--139.4, 139.11 and 139.12 (relating to general; general requirements; and emissions of particulate matter). The time period from the beginning of the first test to the end of the third test may not exceed 8 hours.

(2) The opacity of emissions, as determined in accordance with the measurement technique specified in §123.45 (relating to alternative opacity limitations), shall be recorded for the entire time period from the beginning of the first performance test to the end of the third performance test.

(3) If continuous opacity monitoring equipment is required, it must be installed, operated, and maintained in accordance with the provisions of Chapter 139, Subchapter C (relating to requirements for continuous in-stack monitoring for stationary sources).

(4) If continuous opacity monitoring equipment is not required, visual observation of opacity must be conducted by the source owner or operator in accordance with the procedures in Appendix A, Method 9 of §139.102(1) (relating to references).

(5) Prior to the first performance test, the results of opacity measurements obtained in accordance with the technique specified in §123.45 will be compared to the results of visual observations conducted by the Department in accordance with Appendix A, Method 9 of §139.102(1).

(i) A series of 60 consecutive observations will be conducted by the Department observer at intervals of 15 seconds. The results will be reduced to 15 one-minute averages.

(ii) The opacity measurements obtained by the techniques specified in §123.45 for the same time period will be reduced to 15 one-minute averages corresponding to those calculated in subparagraph (i) of this paragraph.

(iii) If any of the 1-minute averages as calculated in subparagraph (ii) of this paragraph differ by more than 15% opacity from the corresponding 1-minute average as calculated in subparagraph (i) of this paragraph, the cause must be determined and the comparison repeated

after appropriate adjustments have been made but before commencement of the first performance test.

(iv) If the average of the absolute values of the differences between the one-minute averages as calculated in subparagraph (ii) of this paragraph and the corresponding one-minute averages as calculated in subparagraph (i) of this paragraph is greater than 7.5% opacity, the cause must be determined and the comparison repeated after appropriate adjustments have been made but before commencement of the first performance test.

§139.18. Calculation of alternative opacity limitations.

(a) The results of opacity measurements obtained by the technique specified in §123.45 (relating to alternative opacity limitations) for the entire time period from the beginning of the first performance test to the end of the third performance test will be reduced to 1-minute averages.

(b) The 1-minute averages which correspond to each of the three performance tests will be used for calculation of the alternative opacity limits and treated as if they represented contiguous data.

(c) The highest 1-minute average as determined in subsection (b) is the alternative opacity limitation not to be exceeded at any time.

(d) The median value of the 1-minute averages as determined in subsection (b) is determined.

(e) One-minute averages equal to or less than the median value calculated in subsection (d) will be eliminated from calculations in subsections (f) and (g).

(f) The mean and modified 95% confidence interval shall be calculated for the remaining 1-minute averages as follows:

$$\overline{X} = \frac{\sum_{i=1}^{n} Xi}{n}$$

$$C.I_m = \frac{2}{n\sqrt{-1}} \sqrt{\frac{n}{i=1} n(\Sigma X^2 i) - \frac{n}{i=1} (\Sigma xi)^2}$$

where: $\overline{X}$ = mean
Xi = individual 1-minute average
n = number of individual 1-minute average (after elimination of averages less than or equal to the median value)
$C.I_m$ = modified 95% confidence interval

(g) The alternative opacity limitation not to be exceeded more than 3 minutes in any 1-hour shall be equal to the sum of the mean and the modified 95% confidence interval as calculated in subsection (f) ($\overline{X} + C.I_m$), truncated to an integer % opacity.

(h) An hourly average opacity limitation not to be exceeded at any time will be calculated as follows:

(1) The 1-minute averages as determined in subsection (b) will be grouped in discrete hourly time periods starting with the beginning of the first performance test.

(2) A remaining 1-minute averages constituting less than a full hourly time period will be eliminated from calculations in paragraphs (3) and (4).

(3) The mean for each hourly time period will be calculated as follows:

$$\overline{X} = \frac{\sum_{i=1}^{60} Xi}{60}$$

where: $\overline{X}$ = mean
X_i = individual one-minute average

(4) The hourly average opacity limitation not to be exceeded at any time shall be equal to the highest mean as calculated in paragraph (3) truncated to the nearest integer % opacity.

§139.21. [Reserved]